Zurich University of Applied Sciences
ZHAW
School of Management and Law
BSc International Management

Bachelor Thesis

Pharma Post-Merger Integration

Success Factors and Best Practices in the Integration of Swiss Biotech Start-ups

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Winterthur, 27 May 2020

Management Summary

Mergers and acquisitions (M&As) are an ongoing trend in the life science sector, and especially big pharma companies have been active buyers, acquiring, amongst others, innovative biotech start-ups. In practice, M&As often fail due to faults in the post-merger integration (PMI) phase. PMI is essentially difficult between big pharma and biotech start-ups due to organisational differences and the organic nature of a biotech's innovativeness. Whilst extensive literature is available on the subject, there still is a need for bridging the gap between theory and practice to give tailored advice for excellence in PMI for this type of undertaking. As the trend of M&As between big pharma and biotech start-ups is likely to continue, a practical review of context-specific success factors (SFs) may help companies to master the integration task.

This thesis aimed at identifying specific SFs for the integration of biotech start-ups into big pharma. To do so, the practical applicability of theoretical success formulas as well as employed best practices were investigated for this integration scenario. Hence, selected established integration success frameworks and hypotheses on M&A trends and motives by academic scholars and industry experts were tested. The methodology consisted of a qualitative analysis of desk research and interviews, with a focus on M&As between 2005 and 2019 where the top 20 big pharma acquired Swiss biotechs. A trend analysis of such M&As was made for general contextualisation, and a case study analysis on PMI SFs was conducted, featuring GlycArt and Roche, ESBATech and Alcon/Novartis and Actelion and Johnson & Johnson.

The analyses found a strong tendency for "originators" to acquire "innovators" and that for biotech acquisitions, big pharma has the motive of accessing both innovations and innovative capacity, which confirms the established hypotheses. Moreover, the selected theoretical integration success frameworks proved highly applicable to this type of integration scenario, albeit requiring some flexibility in practical use.

The newly identified PMI SFs from best practice are Alignment & Commitment: Shared Vision for Genuine Added Value, Autonomy & Coordination: Striking the Balance, Individualism & Collectivism: Best of Both Worlds, and Entrepreneurialism & Empowerment: Path the Road to Success. These context-specific integration success factors should enable big pharma to derive the full value from the biotech start-ups' organic and unique innovative capabilities, while mastering the amalgamation process and acting as a catalyst for entrepreneurial success.

The thesis provides a comprehensive overview on the subject-matter and contributes to closing the gap between theory and practice. The verified and newly identified PMI SFs are applicable for M&As between big pharma and biotech start-ups. Further case study analyses, trend analyses, and in-practice testing are recommended to solidify and expand on the findings. As every M&A is unique, a broad array of validated post-merger integration success factors is required to fully support companies in the integration task.

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1 Introduction

1.1 Problem Statement & Scope

Merger and acquisition (M&A) is a common event in the life science sector. Big pharma, that is the large pharmaceutical companies which dominate the industry, has been especially active in undertaking M&As, seeking new sources of competitive advantage and growth. Besides the trend for mega mergers in this sector, big pharma companies have also been making targeted acquisitions that specifically support their research and development (R&D) activities (Bansal et al., 2018; Ernst & Young, 2019). Originating novel drugs is a core focus of big pharma, evidenced by a cumulative R&D investment of nearly USD 70 billion in 2018 from the top 10 spenders among big pharma. The drug market, however, is no longer dominated by classical chemical pharmaceuticals. In fact, biopharmaceuticals derived from biotechnology claimed 53% of the worldwide drug sales in 2018 (EvaluatePharma, 2019). Thus, big pharma has started to expand its expertise in biotechnology over the years. The main actors in the biotechnology industry, however, are biotechs, typically small- to mid-size life science companies with a dedicated focus on biotechnology. These biotechs have also been increasingly successful at innovating novel drugs (Pategou, 2019). Of the new US drug approvals in 2018, 49% were originated by biotechs (Geilinger & Leo, 2019). Hence, there has also been a trend for big pharma acquiring biotech start-ups, that is entrepreneurial ventures in early to late growth stages often financed by venture capital (VC) (Booth, 2020; Geilinger et al., 2020; KPMG, 2020). The long-term benefits of such acquisitions, however, are only realised if big pharma effectively capitalises on the biotechs' R&D capabilities. As it is the case with all M&As, the simple purchase of a company does not suffice to turn it into a success. In fact, post-merger integration (PMI) is a key aspect of M&A and one of the most decisive phases for deriving the expected value from the acquisition. However, in practice, many M&As fail due to faults in the PMI phase (Bergamin & Braun, 2018; Ernst & Young, 2018; Schweizer, 2016).

The focus of this bachelor thesis lies on the post-merger integration of Swiss biotech start-ups into big pharma companies. Switzerland is one of the world's biotech hubs, especially strong in medical biotechnology, which flourishes through the roughly 312 Swiss-based biotechs, many of which have organised into clusters such as the Bio-Technopark in Schlieren, Zurich. Moreover, the Swiss biotech hub has witnessed the emergence of many promising and successful start-ups, supported by the strong network of leading academia, big pharma, and venture capitalists in the region as well as through the accessibility of highly qualified human capital and a resilient financial sector (Swiss Biotech, 2020; Switzerland Global Enterprise,

2019). Hence, the Swiss market for biotech acquisitions by big pharma provides an ideal population for the research scope of this bachelor thesis.

1.2 Aim, Research Question, & Hypotheses

The aim of this bachelor thesis is to investigate scope-specific success factors and best practices for the integration of Swiss biotech start-ups into big pharma companies. This paper, therefore, tries to find practical evidence in support of established integration success frameworks prescribed by academics and industry scholars. Moreover, the paper aims at contributing to closing the gap between theory and practice in PMI research by expanding the theoretical success formulas with additional scope-specific PMI success factors (SFs) based on observed best practices that are not fully accounted for by the theory.

This paper tries to answer the following main research question:

> What are success factors in the post-merger integration of Swiss biotech start-up into big pharma?

To accomplish this, the research question is further divided into three sub-questions:

1. Is the generic integration success framework prescribed by Bergamin and Braun (2018) applicable to the scope?
2. Is the industry-specific integration success framework prescribed by Schweizer (2005b) applicable to the scope?
3. Can further scope-specific success factors be identified on the basis of best practice observations?

To answer the research question, a qualitative case study approach will be used relying on information gathered through desk research and interviews. Moreover, this paper will test three hypotheses on scope-specific M&A trends and motives, which will help to provide some context for the case studies and research findings. Consequently, this paper will also undertake a high-level trend analysis of "big pharma acquires Swiss biotech" using historical data on M&A transactions and desk research findings.

In line with the observations of Kurmann Partners (2017) on past M&A activity in the pharma industry, H1 will be tested for M&As between Swiss biotechs and big pharma:

H1: There is a high tendency for "Originators" (→strategic archetype of pharma) to acquire "Innovators" (→biotechs developing new molecules)

Using Schweizer's (2005b) propositions on M&A motives, on the basis of which he constructed his industry-specific integration theory, H2 and H3 have been formulated with slight adaptations and will be controlled for the selected PMI case studies:

H2: When acquiring biotechs, the short-term motive of big pharma tends to be the improvement of market positions by accessing the biotech's innovations.

H3: When acquiring biotechs, the long-term motive of big pharma tends to be the support of the overall growth strategy by accessing the biotech's innovative capacity.

1.3 Outline

This bachelor thesis is structured into seven further chapters. Chapter 2 will provide a review of the theory on M&A based on the most relevant literature, with particular focus on post-merger integration. The chapter will end with a detailed introduction to the integration theory of Bergamin and Braun (2018), which constitutes the generic integration success framework. Chapter 3 will first provide an overview of the pharmaceutical and biotechnology industries with focus on industry characteristics, classifications, challenges, and trends. Secondly, the chapter will explain the need for inter-industry collaboration, with particular focus on M&As and underlying buyer and target motivations. The chapter will end with a detailed introduction to the integration theory of Schweizer (2005b), which constitutes the industry-specific integration success framework. Subsequent to the establishment of the theoretical foundation for this thesis, Chapter 4 will provide a detailed research methodology and end with the presentation of a consolidated PMI SFs framework, which will serve as a guidance for the case studies and allow for the assessment of the applicability of the integration success frameworks prescribed in the theory. Chapter 5 will present the trend analysis on the Swiss biotech acquisitions by big pharma between 2005 and 2019. The focus of the trend analysis will be on which big pharma company type acquires which Swiss biotech company type and for what strategic purpose. Chapter 6 will present the case study analysis on scope-specific PMI SFs based on three selected M&A cases. The focus of the case study analysis will be M&A context, integration strategy, integration management, and value creation. Each case study will end with a case assessment in which the applicability of the consolidated PMI SFs framework is examined, and the observed best practices are highlighted. Chapter 7 will provide a discussion of the research findings on M&A trends and motives, theoretical integration success frameworks applicability, gap analysis between theory and practice, and, finally, additional PMI SFs based on best practice observations. Chapter 8 will present the conclusion, including research contribution, limitations, and further areas of research.

2 Mergers and Acquisitions

Mergers and Acquisitions describe a group of operational corporate restructuring activities that follow a friendly takeover decision (DePamphilis, 2019).

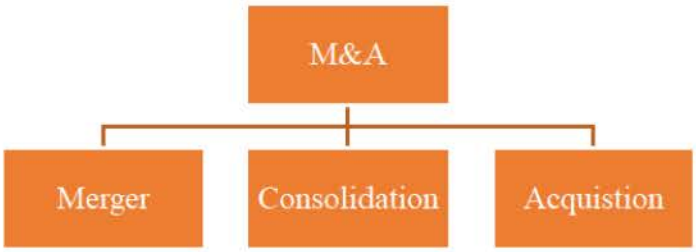

Figure 1: Merger and Acquisition Types. Adapted from DePamphilis (2019, p. 21).

An acquisition is a corporate event where "a company takes a controlling interest in another firm, a legal subsidiary of another firm, or selected assets of another firm" (DePamphilis, 2019, p. 21). Acquisitions can thus take the form of either share or asset deals. In M&A terminology, the purchasing company is called the "acquirer" or "buyer", whereas the acquired company is referred to as the "target". The acquisition itself classifies as a "transaction" or "deal". Mergers differentiate from acquisitions in that they usually involve two companies of equal size fusing together, which often marks the legal extinction of one company's existence. As for consolidations, they distinguish themselves from acquisitions and mergers in that the combined companies are transformed into a completely new legal entity (DePamphilis, 2019). For the benefit of reducing complexity, this paper will predominantly use the terms M&A and acquisition interchangeably.

2.1 The Underlying Rationale

The underlying rationale of an M&A as a corporate restructuring activity can be found in a company's strategy for revitalisation and growth and its decision to explore either existing or new sources for this (Galavotti, 2019). According to Haspeslagh and Jemison (1991), there are three distinct paths to corporate renewal that a company can take: strengthen its domain, expand its domain, or explore new domains. Hence, when the need for corporate renewal emerges, a company might be required to develop new resources and capabilities to realise its strategy. Hereby, the choice between organic and inorganic growth presents itself. In contrast to general perception, acquiring the required asset bases might be preferable to developing them internally. This is foremost due to the fact that some resources are rare and not easily imitable. Considering the cost and time impact that organic growth generally entails, acquisitions can be a cheaper and faster means for obtaining new resources and capabilities (Galavotti, 2019).

Acquisitions, therefore, can be considered an instrument for achieving corporate renewal, and the M&A motive can often be traced back to the general strategic direction of a company (Galavotti, 2019).

2.2 The Purpose of M&A

The main purpose of an M&A is the creation of value. Accordingly, the imperative for value-adding M&As is the generation and exploitation of synergistic effects, which result from the combination of two companies (Galavotti, 2019). This can be visualised in a function where the value of the combined companies exceeds the cumulative value of the individual companies:

Figure 2: Value Creation through M&A. Adapted from Galavotti (2019, p. 92).

The specific motives for companies to engage in M&As are plentiful. Some general M&A motives centre around sales synergies (e.g. increased market power, greater market coverage, accelerated revenue growth), cost synergies (e.g. economies of scale, economies of scope, complementary asset bases), financial synergies (e.g. increased leverage, lower cost of capital), diversification, resource redeployment, and strategic realignment (DePamphilis, 2019; Galavotti, 2019; Haleblian et al., 2009).

2.3 The M&A Process

M&As do not just encompass the acquisition event itself, where one company obtains the legal ownership of another company, but they involve an array of activities that need to be performed in order to plan and implement the acquisition. This series of activities forms the M&A process. Generally, the M&A process can be structured into three periods: pre-acquisition, acquisition, and post-acquisition. The pre-acquisition period includes all preparatory activities that lead up to the acquisition, while the post-acquisition period focuses on the subsequent implementation (Müller-Stewens et al., 2016). For the purpose of defining the most important stages in an M&A process, this paper follows the approach of Bergamin and Braun (2018):

Figure 3: The M&A Process. Adapted from Bergamin & Braun (2018, p. 3).

From a buyer perspective, a company may develop the need for corporate renewal and decide to explore the possibility of an M&A. Based on its corporate strategy, it devises an acquisition plan in which it clearly defines its M&A objectives in terms of value creation. Subsequently, the company begins to survey the market for potential target companies and establishes contact. It progresses to thoroughly screen the identified target(s), conducting due diligence and entering into negotiations. The deal closing includes the signing of a legal contract that substantiates the M&A, a successful ownership transfer, and the fulfilment of impending regulatory obligations. Thereafter, the integration of the target commences. The goal of PMI is the actual realisation of the identified value-adding potential (Bergamin & Braun, 2018; Müller-Stewens et al., 2016).

According to Bergamin and Braun (2018), the phases of strategy development and post-merger integration are most decisive for the ultimate success of an M&A. In the initial planning phase, the value-adding potential of an acquisition is determined and the strategy to secure said value is formulated. The PMI phase, on the other hand, consists of the strategic measures implemented to derive the identified value from the M&A. Conclusively, M&As that fail to deliver on value-adding expectations usually underperform in these two phases (Bergamin & Braun, 2018; DePamphilis, 2011).

2.4 The Post-Merger Integration Phase

2.4.1 Integration Strategies

The PMI phase directly contributes to the success of an M&A. Companies are not only faced with the pressure of generating returns on investments from synergy exploitation, but they also have to tackle the human, cultural, and organisational aspects of an integration. It is, thus, crucial for a company to formulate and implement the right integration strategy for an M&A.

A highly accredited typology for integration strategies is the one established by Haspeslagh and Jemison (1991). The authors classify integration approaches according to two dimensions. The first dimension assesses the need for strategic interdependence between acquirer and target by identifying the degree of resource and capability transfer required for synergy exploitation. The second dimension assesses the level of organisational autonomy that needs to be granted to the acquired company by investigating the extent to which the target can be integrated without risking the loss of those valuable resources and capabilities that cannot be transferred (Galavotti, 2019; Haspeslagh & Jemison, 1991). According to these dimensions, four different types of integration approach are defined:

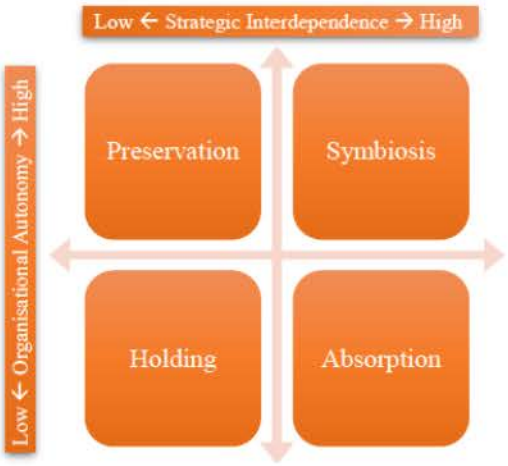

Figure 4: Integration Approaches Matrix. Adapted from Galavotti (2019, p. 112).

Preservation strategies provide the highest level of organisational autonomy to the acquired company through limited integration. The strategic interdependence between the companies is minimal, and the primary focus lies on the protection of target-specific capabilities. The absorption approach aims at synergy exploitation by full integration of the acquired company into the new parent company. The need to preserve the target's autonomy is minimal. The third type of integration strategy applies to M&As that require high levels of both strategic interdependence and target autonomy. Symbiosis, thus, takes the middle ground and prescribes a balance between preserving the target's unique capabilities and exploiting available synergistic effects to effectively create value. A holding strategy accounts for acquisitions, for example conglomerate M&As, where both strategic interdependence and target autonomy requirements are low. Hence, it usually does not entail any integration efforts (Angwin, 2012; Bergamin & Braun, 2018; Galavotti, 2019).

2.4.2 Steps within the Framework of an Integration Project

PMI is arguably one of the most complex and critical phases of the entire M&A process. The previous section outlined four types of integration strategies that can be chosen based on the respective M&A context.

Integration management, on the other hand, consists of more than just choosing a suitable integration strategy. In the post-acquisition stage, managers are put under enormous pressure to deliver the desired M&A benefits within resource, time, and cost constraints. Moreover, the integration team has the challenging task to manage the various expectations and needs of all affected stakeholders. Thus, this particular phase requires "a sustainable and fine-tuned integration management" that tackles PMI issues, takes rapid decisions, and paths the way for performance transformation (Bergamin & Braun, 2018, p. 33). Bergamin and Braun outline five essential steps in the management of an integration project:

Figure 5: Steps within the Framework of an Integration Project. Adapted from Bergamin & Braun (2018, p. 6).

For each of these steps, the authors define guiding principles as well as success factors and pitfalls which should be considered when managing an integration project.

2.4.2.1 Outline Vision and Kick-start the Integration Project

The first key step in an integration project is to formulate a clear vision and to develop a plan for achieving the desired future state. This needs to happen well before the closing of the M&A in order to have a targeted course of action once the PMI phase begins. Early strategic planning is crucial for the success of the entire integration project (Bergamin & Braun, 2018). Figure 6 summarises the guiding principles, success factors, and pitfalls for this step:

Figure 6: Step 1 of an Integration Project. Own Creation, Based on Bergamin & Braun (2018, pp. 7-12).

The main imperative is to recognise the importance of proper strategic preparation, effective leadership, clear accountability, and speedy but informed decision-making in the light of uncertainty. Companies should communicate a sense of direction to their employees and other stakeholders in order to minimise the sentiment of ambiguity and avoid an operational "nirvana." Bergamin and Braun (2018) further emphasise the central role of promoters, namely the leading figures of the respective companies and the M&A deal in general. The involvement of promoters, both in the integration planning and subsequent management, fosters company-wide commitment to the project and the "new" company. Moreover, it is equally important to encourage operative key personnel to participate in the integration project for resonance on all

hierarchical levels. The authors describe this as "[w]in the hearts and minds" (Bergamin & Braun, 2018, p. 8). Integration management is in many ways a learning process, and capitalising on previous M&A experience can help in mastering the preparation task. Consultative guidance may also be of great advantage considering the complexity of an integration project. Both the top management and the integration team can benefit from accessing a broad variety of external and internal expertise. Finally, it is necessary for the integration management to keep a clear focus and follow stringent priorities when undertaking the integration efforts (Bergamin & Braun, 2018).

2.4.2.2 Ensure Effectiveness of Future Organisation

The second step in the integration process revolves around the issue of safeguarding operative activities after a completed M&A (see Figure 7). Bergamin and Braun (2018, p. 12) advocate that "[i]n order to secure smooth operations, the two organizations have to properly merge and focus their exploitation of synergies on genuine value drivers."

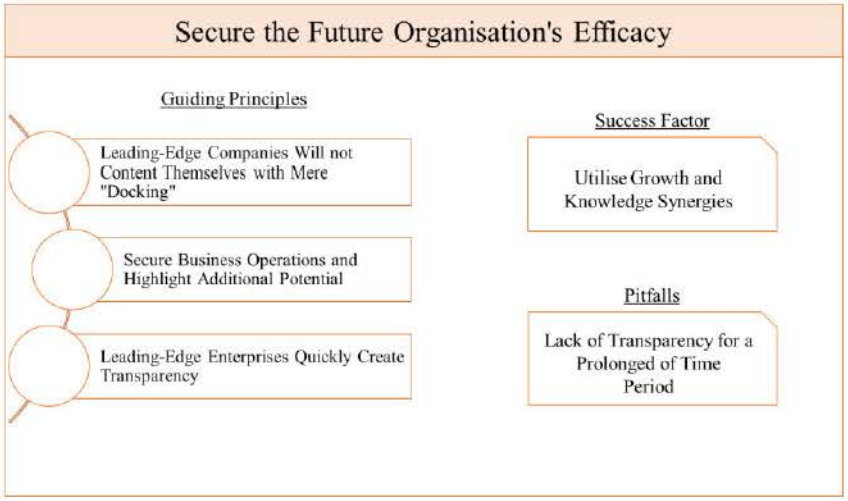

Figure 7: Step 2 of an Integration Project. Own Creation, Based on Bergamin & Braun (2018, pp. 12-16).

According to Bergamin and Braun (2018), an acquirer should develop an integration strategy that fits the situation at hand and not pursue a simple "docking" of the companies just for the benefit of ease. To truly exploit the value-adding potential of an M&A, managers are advised to look beyond cost synergies and explore other value-adding opportunities as well. Growth and knowledge synergies, in particular, constitute important sources of value. It is further imperative to formulate a mutual strategic mission and develop organisationally as well as psychologically into a fused entity. In terms of stakeholder management, Bergamin and Braun (2018) prescribe transparency and open communication, especially between acquirer and target, concerning the integration strategy and the integration progress. Information barriers between

acquirer and target often distort integration activities and might become a serious issue if problems go unnoticed for too long (Bergamin & Braun, 2018).

2.4.2.3 Appoint the Management Team

The third step in an integration project is a timely and firm appointment of the official management team for the merged companies (see Figure 8), preferably even before the closing of the M&A. This contributes to the creation of a stable foundation for the PMI phase and the avoidance of ambiguity (Bergamin & Braun, 2018).

Figure 8: Step 3 of an Integration Project. Own Creation, Based on Bergamin & Braun (2018, pp. 16-18).

While corporate management appointment is undoubtedly important, organisational hierarchies and responsibilities in general should be reviewed and reaffirmed on operative and functional levels. To further support amalgamation and knowledge transfer in the post-acquisition environment, companies are encouraged to facilitate an exchange of key personnel. Furthermore, the retention of key personnel and leadership figures is highly crucial for a company's long-term success, and integration efforts should thus concentrate on gaining employee commitment and winning the loyalty of promoters. Bergamin and Braun (2018) also point out that companies are most successful when they take a holistic approach to corporate restructuring, personnel redeployment, and inter-organisational collaboration. They argue that this enables the proper circulation of knowledge and supports integration on a functional level. Limiting personnel and knowledge exchange only to the top-level management can quickly become a pitfall for the acquisition as the taken integration measures might not have sufficient reach (Bergamin & Braun, 2018).

2.4.2.4 Align Management and Staff

The fourth step in the organisation of an integration project regards the alignment of both management and staff to the vision of becoming a new entity (see Figure 9). Inspiring profound

behavioural change among employees is decisive for the achievement of the desired organisational transformation through the integration process (Bergamin & Braun, 2018).

Figure 9: Step 4 of an Integration Project. Own Creation, Based on Bergamin & Braun (2018, pp. 19-21).

Bergamin and Braun (2018) emphasise the benefit of employee training for creating a readiness to cope with the changes and issues resulting from an M&A. They further state that "[a] company can only be integrated successfully, if its integration efforts are backed by its employees" (2018, p. 19). To facilitate employee commitment, it is thus highly recommendable to reward integration efforts by aligning the company's incentive schemes. If not adjusted to the situation, incentives might fail to generate the necessary motivation for driving ahead the integration project. Finally, prolonging the initiation phase should be considered in order to allow sufficient time for the integration team to devise a sound plan with precise integration measures, quantified objectives, and good mitigation strategies (Bergamin & Braun, 2018).

2.4.2.5 Address the Merger on an Operative Level

The operative implementation of the integration forms the fifth and final key step of the integration process (see Figure 10). Once the preparatory activities in terms of integration and organisational transformation have been completed, the focus shifts to the realisation of the transition in the day-to-day operations. According to Bergamin and Braun (2018), it is essential to devise an action plan which already adequately accounts for functional unit integration in the strategy formulation phase. Moreover, sufficient support to the operative management should be provided in order to enable the successful implementation of integration measures (Bergamin & Braun, 2018).

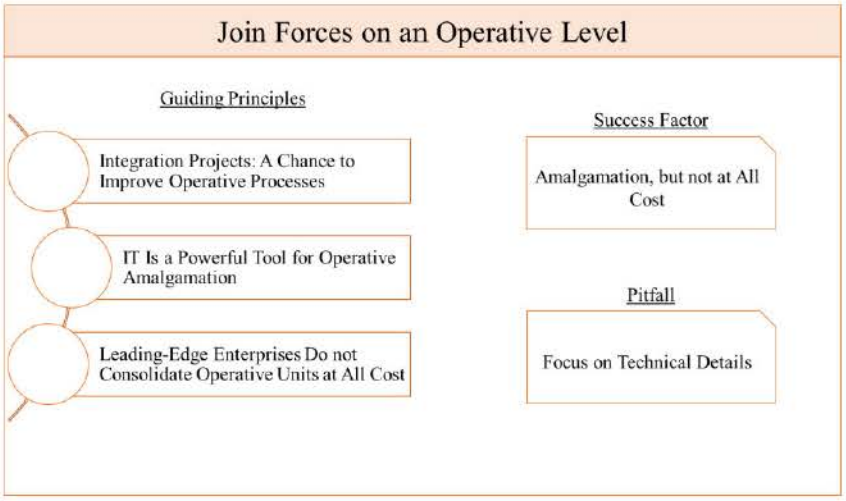

Figure 10: Step 5 of an Integration Project. Own Creation, Based on Bergamin & Braun (2018, pp. 22-23).

The first principle for this step mandates that the transformation brought about by integration offers ample opportunities for improvement in general, be it of processes, structures, or behavioural patterns. Migrating or reconfiguring the IT systems can, for instance, assist the organisational integration on an operative level. Bergamin and Braun (2018) further advocate that during the planning of operations integration, it is fundamental to consider the particularities of the transaction and the companies involved. In some cases, it might be advisable to delay consolidation activities and first focus solely on the acquired company in order to create the right conditions for the PMI. Bergamin and Braun (2018) also state that full absorption is not the right strategy for all M&As. In cases where, for example, localisation is key or entrepreneurial spirit is strong, acquirers tend to be more successful when allowing the target company to remain somewhat autonomous. During the integration of operative activities, it is further important for the integration management to focus on the bigger picture. Integration measures and arising challenges should always be dealt with in a prioritised manner to enable a focused and smooth integration process (Bergamin & Braun, 2018).

2.5 Generic Integration Success Framework

On the basis of the described integration project steps, Bergamin and Braun (2018) developed two interconnected concepts for PMI success. Firstly, the authors identified "Five Factors that Make or Break an Integration Project". Subsequently, they devised the "Performance Transformation Concept" that builds upon these factors. These two theoretical concepts establish the generic integration success framework, which will be tested for practical applicability in the case study analysis on scope-specific PMI SFs.

2.5.1 Five Factors that Make or Break an Integration Project

Figure 11 illustrates the five factors that make or break an integration project as proposed by Bergamin and Braun (2018).

The first factor accounts for the observation that leading figures can greatly influence the integration process and the ensuing success of the integration. Charismatic personalities, family-business owners, or entrepreneurial founders hold strong positions in the organisation and the minds of employees. If leading figures from the acquired company are engaged and committed to the M&A, their support can be a true gateway to integration success. As for the acquirer, the involvement of top executives with previous M&A experience or promoters that drove the preceding M&A process can have a very positive impact. An unfavourable management constellation, on the other hand, is rather disadvantageous for the integration management. The integration team might be faced with leading figures that have difficulty to adapt to the new organisational structure, such as entrepreneurial owners or politically privileged managers (Bergamin & Braun, 2018).

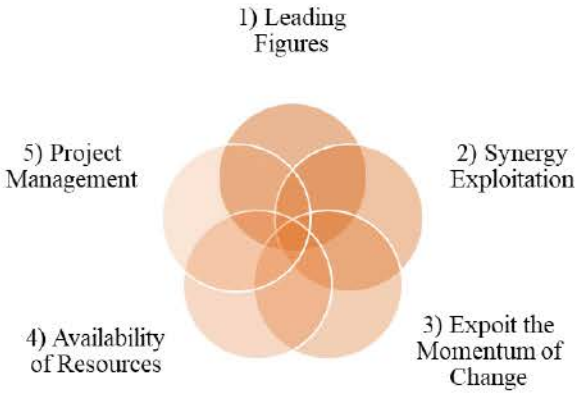

Figure 11: Five Factors that Make or Break an Integration Project. Adapted from Bergamin & Braun (2018, p. 24).

Synergy exploitation, the second factor, emphasises the importance of value creation through integration beyond mere financial considerations. Successful integration efforts centre around the realisation of new market potential and corporate growth. Especially the facilitation of knowledge transfer and innovation can contribute to the achievement of integration success. The acquirer should carefully consider which synergy positions have true value-adding potential and find an appropriate balance in the integration strategy as both under- and over-exploitation produce suboptimal outcomes. Bergamin and Braun (2018, p. 27) argue that a symbiotic integration approach has generally proven successful in practice "where autonomy can partially be retained and mutual dependencies can be put to use at the same time."

The third factor follows the paradigm of exploiting the momentum of change. As integration by itself should already elicit transformative change in an organisation, this momentum can be used well by managers of the acquiring company to tackle other persisting issues which are brought to light by the M&A. Exploiting the situational opportunity to

restructure the entire organisation and reaffirm the strategic direction might create further value and add to the success of integration efforts (Bergamin & Braun, 2018).

The availability of resources is another decisive factor that determines the success of the PMI phase. The resource needs of an integration project should be wisely calculated, accounted for, and disclosed to the involved parties. A prolongation of the initiation phase, for instance, is recommended to reduce the time pressure for the integration team and prevent any rushed or inadequate strategy preparation. Additionally, it supports a cultural approximation process between the key personnel of the merging companies. On a further note, the required resources should be accurately budgeted and communicated so that once the integration commences, the required management and staff can be effectively mobilised. The overall goal is for the integration to proceed with the necessary attention and support, while simultaneously prevent any disruptions to normal business operations due to unexpected resource needs (Bergamin & Braun, 2018).

Finally, the fifth factor for successful integration is the capitalisation on project management expertise. The authors find that many concepts and instruments which originate from project management find their practical application in the governance of the PMI phase. Success in integration projects is often achieved through good due diligence and the design and implementation of integration monitoring mechanisms (Bergamin & Braun, 2018).

2.5.2 The Performance Transformation Concept

On the basis of practical observations of successful integration management, Bergamin and Braun (2018) established their concept for performance transformation, illustrated in Figure 12.

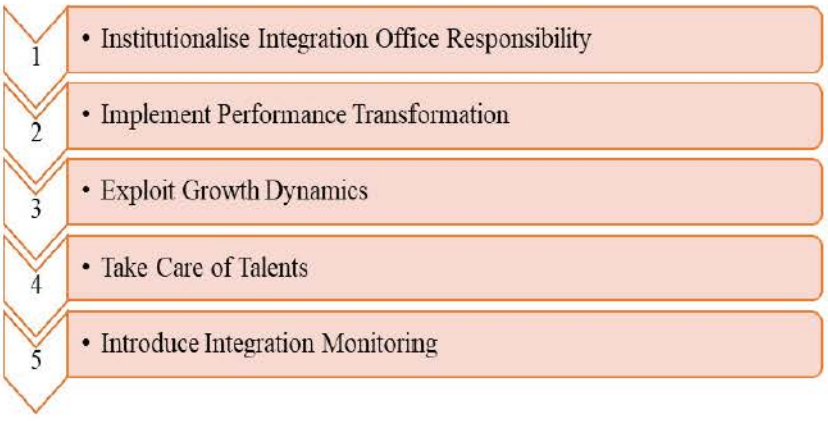

Figure 12: Performance Transformation Concept. Adapted from Bergamin & Braun (2018, p. 36).

Firstly, integration management responsibilities should be appropriately defined and allocated to aid the realisation of the value-adding potential of the M&A. The institutionalisation of these responsibilities and the establishment of an appropriate governance

structure path the way to successful integration management. Bergamin and Braun (2018, p. 38) find that the key is "to make integration responsibility a part of the companies DNA." Integration responsibilities should therefore be properly accounted for in form of an executive steering committee, an integration manager, and an integration office. The integration manager is accountable for the overall integration success, while the integration office takes on the actual work related to the project execution (Bergamin & Braun, 2018).

Secondly, the implementation of performance transformation requires the preservation of existing value, the exploitation of the combinational synergies created by the M&A, and the exploration of "transformational synergies that trigger a radical change in functions, processes or business segments" (Bergamin & Braun, 2018, p. 42). The integration strategy should properly account for the four dimensions of performance transformation design, namely width of integration, depth of integration, areas of integration, and list of priorities (Bergamin & Braun, 2018). As this step of performance transformation is a guidance for formulating a cohesive integration strategy, it will be explained in more detail.

The first dimension, *width*, deals with the strategic objective of the M&A, be it to strengthen the core business, expand into new business areas, achieve growth targets, or realise restructuration. The intended width determines both the specific focus of the subsequent integration efforts as well as the appropriate management approach. The second dimension discusses different types of integration *depths*, which differentiate according to the degrees of autonomy and synergy exploitation that are strategically desired. Under consideration of the companies' unique situational needs, the integration follows a turnaround (= holding), preservative, absorptive, or symbiotic approach. The chosen approach should reflect the underlying corporate strategy and the specific M&A motives (Bergamin & Braun, 2018). These four integration approaches correspond with the previously introduced typology from Haspeslagh and Jemison (1991). The *areas of integration* need to be defined in the third dimension of performance transformation design. According to Bergamin and Braun (2018, p. 45), typical areas of integration include "strategy, organization, business segments, HR and culture, range of products and supplier structure, systems and processes such as taxes and legislation." In this respect, the authors argue that two different types of synergies should be targeted along the various areas of integration. Combinational synergy exploitation often occurs in the form of classical strategic measures, such as economies of scale, while transformational synergies are more complex and have to be created by revolutionising the way the acquirer does its business. Finally, the fourth dimension addresses the need to structure the integration objectives into a *list of priorities*. The executive management and the integration team further

have to evaluate whether a strict enforcement or open democracy better serves to achieve the individual integration objectives. All four dimensions should be considered and attuned in order to derive a performance transformation concept that is in line with the company's strategy of diversification or focus (Bergamin & Braun, 2018).

Exploiting growth dynamics is the third imperative in the concept. The meaning is to not only focus on internal company matters, but also to scrutinise the reactions of customers and markets to the integration. The goal is to send positive signals, stimulate demand, and offer new value propositions. A company can, for example, profit from streamlining business portfolios or exploring cross-selling opportunities. Thus, performance transformation requires consistent customer focus, both in value creation and market communication, in order to deliver corporate growth (Bergamin & Braun, 2018).

Fourthly, talent management can prove to be an important tool for achieving performance transformation, especially for the planning of management constellations. For the acquirer, it is important to have a wide talent pool in case that critical resources are needed in the light of an integration project. For the target, new talents might be excellent candidates for a redeployment into the parent organisation and thereby enable the desired knowledge transfer (Bergamin & Braun, 2018).

The fifth and final imperative of the performance transformation concept is the integration monitoring system. Equipped with the right support infrastructure, the integration management and the team can take a systematic approach to steering ahead the integration process. Examples of monitoring mechanisms include integration scorecards or roadmaps, opportunity and risk management, and post-merger audits (Bergamin & Braun, 2018).

3 Inter-Industry M&A: Pharmaceutical & Biotechnology

Chapter 3.1 introduces the pharmaceutical industry, presenting an industry player classification framework for big pharma as well as the industry challenges and trends that concern research-based big pharma. Chapter 3.2 introduces the biotechnology industry, presenting definitions for medical biotechnology and the characteristics of companies active in the industry. Chapter 3.3 elaborates on the need for cooperation between biotech start-ups and big pharma, highlighting the respective M&A motives. Chapter 3.4 explains the hybrid integration approach by Schweizer (2005b) that constitutes the industry-specific integration success framework which will be tested for practical applicability in the case study analysis on scope-specific PMI SFs.

3.1 Pharmaceutical Industry

Deriving its origins from the chemical industry, the pharmaceutical business has long established itself as a separate key industry in health care. Moreover, pharmaceuticals make up an important product segment of the life sciences sector. The other major life sciences product groups are plant protection agents, animal medicines, vitamins and fine chemicals, and speciality chemicals. Even though pharmaceuticals build the core of the pharmaceutical industry, pharmaceutical companies, especially big pharma, are also highly active in other life sciences product segments (Gassmann et al., 2018).

According to Gassmann et al. (2018, pp. 18–19), "[p]harmaceutical products are defined as substances or mixtures of substances, which are meant for use in the recognition, prevention or treatment of diseases or for some other medical purposes regarding influences on the human organism." The product portfolio of a typical pharmaceutical company primarily consists of pharmaceuticals, but can also include companion diagnostics or medical devices. Moreover, industry players tend to specialise in certain therapeutic areas (e.g. oncology, cardiovascular) for which they develop pharmaceuticals (Gassmann et al., 2018).

An important distinction in the pharmaceutical business concerns drug classifications. Generally, one can distinguish between two types of drugs, namely prescription drugs and non-prescription drugs. While the purchase of the former is regulated, the latter does not require any prior approval and can be bought "over-the-counter," which is why they are commonly referred to as OTC drugs. A further distinction is made between patented and generic drugs. When novel drugs are developed and approved by regulators, they receive patent protection, which prohibits the manufacturing and sale of replications by other companies for a certain period of time. Upon patent expiration, however, other companies can purchase a license that allows them to imitate the original drugs and commercialise the copies, the so-called "generics." Generic drugs usually are of equal quality but much lower-priced than the original versions. Patented drugs are either traditional, chemically synthesised pharmaceuticals or genetically manufactured biopharmaceuticals, so-called "biologics." The copy of a biological medical product, however, is distinctively classified as a biosimilar and not as a generic drug. Finally, one can also classify drugs according to their marketability. The term "blockbuster" is used for drugs that achieve more than USD 1 billion in sales per year. They are typically high-selling patented novel drugs that target common disease areas. Orphan drugs, on the other hand, are drugs which "target rare medical conditions with usually very low patient populations" (Gassmann et al., 2018, p. 19). The development of orphan drugs is actively encouraged by governments and incentive is given

by longer patent protection. Finally, a speciality drug is developed for rare disease areas, for which the treatment becomes increasingly complex and, thus, expensive. Speciality drugs are those drug treatments that cost more than USD 600 per month. Further drug classifications do of course exist, however, the aforementioned types are amongst the most important ones (Gassmann et al., 2018).

The global pharmaceutical industry has historically offered a very profitable business environment with a multitude of companies joining the competition to benefit from the attractive revenue potential and profit margins. The established and fully integrated big pharma companies have long achieved industry dominance and taken centre stage as global drug developers. Still, many other players are also successfully active in the industry, often specialising on individual value or supply chain components, such as raw material manufacturing, R&D, marketing, or distribution (Bradfield & El-Sayed, 2009).

Figure 13 provides an overview of the pharmaceutical value chain as well as the drug discovery process that primarily guides the pharmaceutical R&D activities.

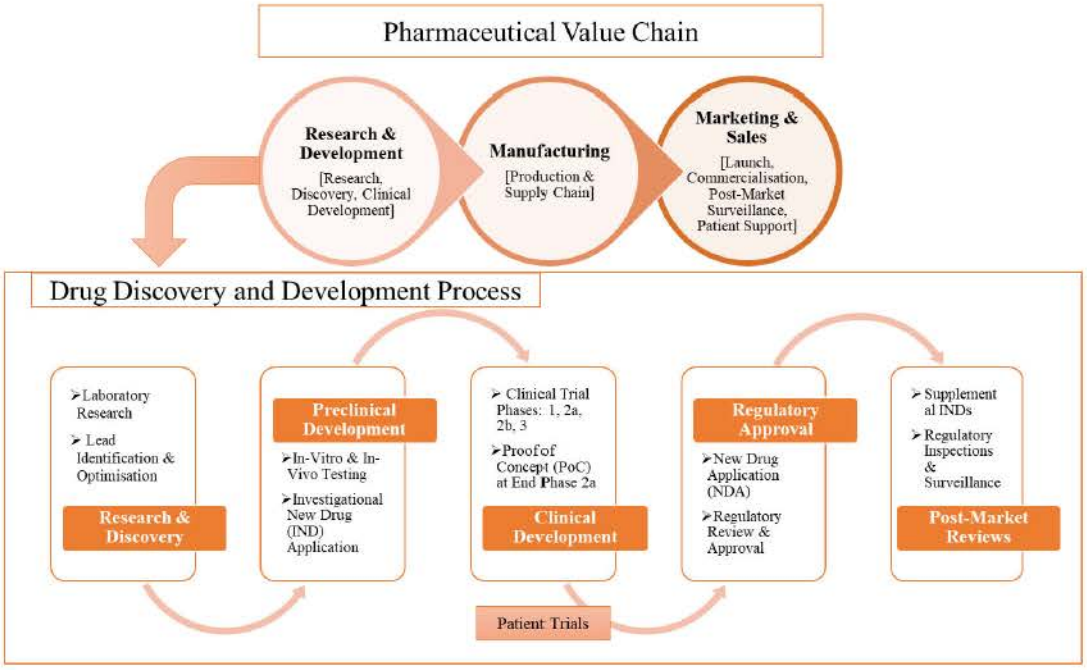

Figure 13: Value Chain & Drug Discovery Process. Own Creation, Based on Deloitte (2019), EUPATI (2015), FDA (2018).

3.1.1 The Four Strategic Archetypes

The Swiss M&A consulting agency Kurmann Partners (2016) established a model which allows the categorisation of pharmaceutical industry players into four distinct archetypes according to their strategic orientation and value propositions. This model will later be used for the trend analysis in Chapter 5 as it is especially useful to classify big pharma. The "4 Strategic Archetypes of Pharma Companies" model is depicted in Figure 14:

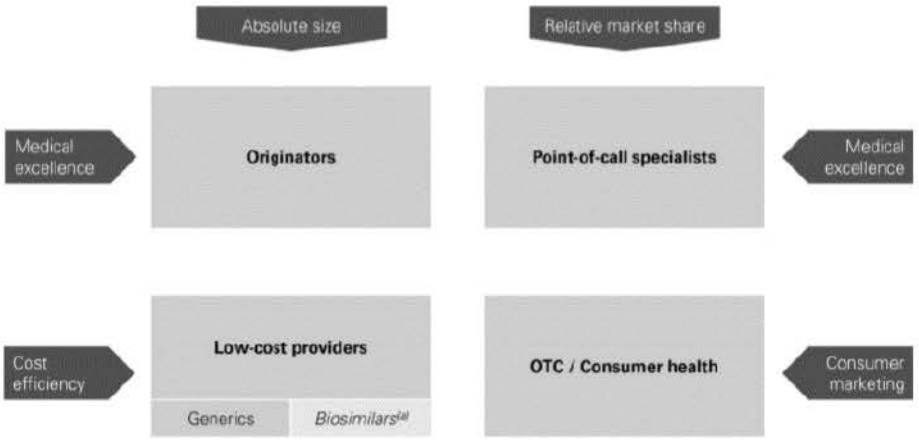

Figure 14: 4 Strategic Archetypes of Pharma Companies, (Kurmann Partners, 2016).

The four archetypes and their characteristics are broadly explained as follows.

Originators, as the name already denotes, specialise in the discovery, development, and commercialisation of novel treatments. The core competency of this archetype lies in selecting and supporting the most promising R&D projects to spur innovation and repeatedly bring new drugs to the market. Originators are the poster child of big pharma in that they are R&D-focused, big in size, and globally active. These giants also excel at clinical testing, patenting, and lobbying for beneficial regulations and reimbursement. M&As are typically undertaken for accessing external innovation and innovative capacity. Gilead, Roche, Merck, and Novartis can be associated with this archetype (Bohner, 2017; Leutenegger & Bieri, 2016).

OTC / Consumer Health companies specialise in the development and sale of OTC drugs, mostly generics or me-too drugs (similar versions to novel drugs, but no copies), and target a very broad consumer audience. Firms of this archetype typically hold relatively high market shares in the segments they serve and have a diversified and large product portfolio. Their core competencies lie in the marketing and distribution of "consumer products with medical claim" (Leutenegger & Bieri, 2016, p. 11). Cost-efficiency, affordability, and brand recognition are the main profit drivers for this industry archetype. Big pharma companies that identify as OTC / Consumer Health companies are Johnson & Johnson, GlaxoSmithKline, Bayer, and Reckitt Benckiser. The archetype's most prominent M&A motive is to increase in size through consolidation (Bohner, 2017; Leutenegger & Bieri, 2016).

Point-of-Call Specialists are highly specialised companies that operate in a selective number of segments in which they achieved medical excellence. Companies of this archetype tend to follow the strategy of product extension in that they "provide comprehensive solutions for an indication or therapeutic area" which go beyond drugs, such as diagnostics and devices

(Leutenegger & Bieri, 2016, p. 11). Point-of-Call Specialists show superiority in portfolio and network management. When undertaking M&As, this archetype often tries to support its competitive advantage and achieve market dominance in its focus segment. Novo Nordisk, Alexion, Sobi, Merz, and Leo are examples of this archetype (Bohner, 2017; Leutenegger & Bieri, 2016).

Low-Cost Providers (LCPs) follow a clear cost-leadership strategy and typically specialise in the fields of generics and biosimilars. By offering "quality products at low prices", LCPs pose a direct threat to Originators once the latter's drugs face patent expiry (Leutenegger & Bieri, 2016, p. 10). Replicating the composition of off-patent drugs allows LCPs to significantly streamline their R&D activities and bring price-competitive alternatives to the market. Companies of this archetype excel at various kinds of value chain optimisations. LCPs usually are huge in size and hold strong competitive positions in each market they serve. M&As by this archetype are often driven by consolidation needs. Examples of LCPs are Teva, Lupin, Sandoz, and Mylan (Bohner, 2017; Leutenegger & Bieri, 2016).

3.1.2 The Industry Challenges

The once flourishing pharmaceutical industry has faced a multitude of challenges compounding over the years, which not only put many big pharma companies to the test, but also inaugurated several shifts in the industry.

One of the most prominent challenges is the heavy decline in R&D productivity. While most pharmaceutical companies have increased their investments in R&D, the output in new molecular entities (NMEs) often falls short of expectations. This phenomenon can be explained by looking at the various interlinked factors impacting either side of the R&D input/output ratio. In terms of expenditures, the cost of developing a new drug from early discovery to commercialisation has risen and nowadays can even exceed the one-billion-dollar mark (Gassmann et al., 2018; Khanna, 2012). Moreover, there is a considerable risk associated with pharmaceutical R&D due to the high attrition rate of potential drug candidates during the discovery process, especially in pre-clinical and clinical trial phases when already considerable amounts of funds have been committed to the projects. The reasons for premature dismissal are often efficacy and safety issues, resulting in an average success rate of less than 5 per cent (Schuhmacher, Gassmann, et al., 2016). Another crucial factor impacting R&D productivity is the extensive amount of time required from initial discovery to approval by the Food and Drug Administration (FDA) and European Medicines Agency (EMA), as well as to the market launch. The time horizon of a pharmaceutical R&D project can even reach up to 15 years in the

new millennium, which amplifies the uncertainty towards R&D cost recovery (Bradfield & El-Sayed, 2009). Finally, the task of drug discovery and clinical development have become increasingly complex and require high commitments in resources and technology (Gassmann et al., 2008, 2018). Hence, the issues of R&D productivity add pressure for big pharma to deliver on the return on investment and growth targets.

Another key industry challenge that magnifies the productivity problematic is the increased need for new drug candidates with blockbuster potential in the R&D pipeline. Most research-based big pharma companies have historically been dependent on blockbuster drugs in their revenue positions (Bradfield & El-Sayed, 2009). However, the development of such high-selling drugs has become a rather difficult growth strategy to sustain over time. Big pharma companies have, thus, increasingly focused on disease areas of potential emerging blockbuster markets with smaller target segments but a "high level of unmet therapeutic need," such as oncology (Gassmann et al., 2008, p. 9). The R&D pipelines of big pharma, however, had difficulty in producing the required innovative breakthroughs in the past which could balance the described increase in R&D expenditures (Kumar, 2012). In fact, the last decade witnessed numerous patent expirations that put big pharma under even more revenue pressure. As this issue continues, big pharma companies are struggling to develop new drugs in their pipelines that can sufficiently offset turnover cuts caused by patent expiry as well as satisfy their ambitious growth targets. Consequently, the industry players have started to diversify and shift their strategic focus towards developing speciality or orphan drugs, often biopharmaceuticals, which promise sufficient revenue potential (Gassmann et al., 2018; Khanna, 2012; Schuhmacher, Gassmann, et al., 2016).

The high level of rivalry which is present in the industry is a further challenge. Research-based big pharma companies face a great pressure to sustain their competitive advantage by continuously developing new innovative drugs with superior clinical profiles and timely bringing them to the market. Moreover, the threat of generics and me-too drugs is keeping these big pharma companies on their toes and forces them to invest highly in R&D as well as marketing for market share protection. In addition, the overall industry is challenged by expanding government regulations that aim at reducing healthcare expenditures in light of the ageing population. Litigation cases on, for instance, negative side-effects or non-conform marketing practices, which also accumulated over the years and prompted regulative scrutiny (Gassmann et al., 2018; Khanna, 2012).

These industry challenges contribute to a more critical perception of big pharma's traditional R&D model and have led many industry players to adapt their strategies in recent years, evident in the industry trends presented in the next section.

3.1.3 The Industry Trends

The traditional pharmaceutical business has been changing over time. Some of the most important trends relate to shifts in market dynamics, scientific and technological advancements, and business model transformations.

According to Gautam and Xiaogang (2016, p. 379), the industry witnessed four important dynamical shifts between 1995 and 2015, namely "massive to lean", "hubs to hotspots", "primary-light, speciality-heavy", and "east to west". Firstly, the authors observe that while big pharma first pursued consolidation with the aim of becoming "massive" and diversified to counteract industry challenges, the later decade saw big pharma companies streamline their activities to a more "leaner and focused" business model, undertaking divestitures from non-core business areas as well as strategically justified acquisitions (Gautam & Xiaogang, 2016, p. 380). Secondly, big pharma companies started to transition from a proliferation of research hubs, a result of the heavy M&A activity, towards centralising R&D activities in the most innovative hotspots of the world with the aim of benefiting from concentrated knowledge. The third trend has already been mentioned in the previous section and describes how pharmaceutical companies shifted their focus from the traditional source of blockbusters, namely "primary care, small-molecule therapies" towards the emerging "speciality and biologic medicines" (Gautam & Xiaogang, 2016, p. 382). Interestingly, many big pharma companies opted for acquisitions to enter the biotechnology field and thereby achieved balanced portfolios between primary care and speciality products in 2015. Finally, the last trend highlighted by Gautam and Xiaogang (2016) is of geographical nature. The authors observe that while in 2005, revenues in the industry were mostly derived from western developed countries, the subsequent decade showed rapid market growth in the East, with China becoming a key market for pharmaceutical products. Moreover, pharmaceutical players from emerging markets have also gained on competitiveness, and Shanghai has joined the ranks of key innovation hotspots for global pharmaceutical R&D (Gautam & Xiaogang, 2016).

Turning the focus to more current trends, the pharmaceutical industry has also been greatly impacted by scientific and technological breakthroughs. Commencing with the progress in biotechnology, the advances in various scientific fields have revolutionised the task of drug discovery and development. Digitalisation, on the other hand, has also been transforming the

healthcare industry. Novel technologies and methodologies in chemical and biological sciences as well as data-driven disciplines, such as bioinformatics, high-throughput screening, artificial intelligence, and big data, have emerged over the years. Not only do these advances improve the identification and testing of potential drug targets, but they also support the transition towards personalised medicine in health care (Gassmann et al., 2018; Gautam & Xiaogang, 2016; Jacobsen & Wertheimer, 2010).

Another trend in the pharmaceutical industry is the disaggregation of value chains, with big pharma becoming increasingly agile and collaborative. The industry giants realised that in order to deal with the growing complexity of R&D, they needed to streamline their portfolio management and leverage the innovative knowledge and technologies which are generated externally. A transition towards open innovation and agility has been enabled by the likes of R&D restructuring, outsourcing, in- and out-licensing, M&As, public-private partnerships with academia or other companies, venture funds, innovation camps, crowdsourcing, open source innovation, and virtual R&D. The trend towards open innovation does not only support R&D efficiency, but is also likely to trigger changes to the general business model of big pharma (Gassmann et al., 2018; Khanna, 2012; Schuhmacher, Gassmann, et al., 2016).

Consulting agencies predict that the traditional business model of pharmaceutical companies will change fundamentally in the future. Rejuvenated innovation, especially in the fields of genomics and immunology, in combination with the unique opportunities provided by big data and other advances in technology will open new pathways for pharmaceutical companies. With the changing health care system towards more affordable, preventative, and patient-centric treatment options, big pharma is thus expected to find agility through organisational transformation (Berggren et al., 2018; Rohrbach, 2017).

3.2 Biotechnology Industry

The origins of biotechnology date back to ancient times with the emergence of practices such as animal domestication in 8000-4000 BC. Ever since, biotechnological progress has given way to major advancements in science and its application, including the evolution of fermentation, genetics, and DNA research. The rise of modern biotechnology in 1977 marked the beginning of a new area and brought enormous benefits to human life and the society at large. Biotechnology as a key industry was birthed in the 1980s as the first biotechnological products were invented and marketed by "scientists turned entrepreneurs." The company Genentech is considered the pioneer of modern biotechnology due to its invention of human insulin (Bhatia, 2018; Evens & Kaitin, 2015).

3.2.1 The Art of Biotechnology

Bhatia (2018, p. 1) defines biotechnology as "[t]he utilization of biological processes, organisms or systems to produce products that are anticipated to improve human lives." Splitting the term into the distinct parts "bio" and "technology", one derives that biotechnology encompasses "a set of techniques that are employed to manipulate living organisms, or utilize biological agents or their components, to produce useful products/services" (Bhatia, 2018, p. 3). The discipline of biotechnology applies to and overlaps with many other fields of science, such as biochemistry, chemical biology, molecular biology, microbiology, cell biology, genetics, immunology, virology, environmental sciences, and engineering (Bhatia, 2018; Ho & Gibaldi, 2013; Patzelt et al., 2012).

It is important to distinguish between four different areas of biotechnology, namely "red", "white/grey", "green", and "blue." The area of red biotechnology concentrates on human health care and is, thus, commonly termed medical biotechnology. Industrial white/grey biotechnology refers to the development of industrial products (e.g. biofuels, chemicals, pharmaceuticals) using biological material and processes. The remaining two areas consist of agricultural green biotechnology and marine/aquatic blue biotechnology (Bhatia, 2018; Patzelt et al., 2012; Tyagi et al., 2018). While all areas of biotechnology are important fields for life sciences, the focus of this paper lies on medical biotechnology.

According to Pham (2018, p. 449), medical biotechnology involves "the application of biotechnology tools for producing medical products that can be used for the diagnosis, prevention, and treatment of diseases." Its utilisation has benefited health care in various ways, Bathia argues, "from making medicines more effective in terms of cost and efficiency, to tackling one of the most difficult branches of medicine, curing genetic diseases" (2018, p. 28). Albeit the scope of medical biotechnology being vast, the major areas consist of biopharmaceuticals, gene therapy, pharmacogenomics, and genetic testing (Bhatia, 2018). Biopharmaceuticals refer to the derivation of therapeutic drugs from biological material, precisely from macromolecules such as proteins, DNA, or RNA. The field of gene therapy utilises gene manipulation and modification to diagnose and treat various diseases (e.g. cancer). Pharmacogenomics and genetic testing are used to analyse the genetic information of an individual. But while the former uses the information on genetic make-up to determine drug responses, the latter deals with the examination of the material for identifying genetic diseases and disorders (Bhatia, 2018). In addition, Pham states that "[m]olecular medicine, personalized medicine, and regenerative medicine have branched out of medical biotechnology to generate a new era of healthcare science" (2018, p. 468). These branched-out fields are especially

impactful in transforming the pharmaceutical industry. Examples of products developed in medical biotechnology include antibiotics, recombinant proteins, hybridoma and monoclonal antibodies (MAbs), vaccines, stem cell therapy, and tissue engineering (Pham, 2018).

Biopharmaceuticals, that is large (biologic) molecule-drugs, are inherently different to traditional pharmaceuticals, the small-molecule (chemical) drugs, and arguably more efficient and stable in their utilisation for treatment indications. The drug discovery and development process in biotechnology, albeit being indeed more complex, is also more targeted, comprehensive, and innovative than the traditional pharmaceutical methodology (Ho & Gibaldi, 2013; Powell, 1996). The scientific breakthroughs in modern medical biotechnology and commercialisation thereof, however, would not have happened without the innovative and dedicated biotechs which have emerged since the 1970s (Evens & Kaitin, 2015).

3.2.2 The Commercialisation of Biotechnology

The rise of the modern biotechnology industry was accompanied by the birth of numerous entrepreneurial companies, striving to commercialise their biotechnological innovations. Powell (1996, p. 199) finds that "[t]he science underlying biotech has its origins in university laboratories and research institutes." Despite science and business typically being separate disciplines, the field of biotechnology witnessed many scientists becoming entrepreneurially active upon making a valuable discovery. This behaviour gave way to the formation of biotech start-ups led by so-called "scientist-entrepreneurs" and financially backed by VC investors (Patzelt et al., 2012; Powell, 1996).

The identity of these founders also impacted the corporate culture and business model of the typical biotech start-up. On the one hand, the entrepreneurial spirit and academic background of the founders made the biotech companies primarily science-driven and adopt a team-based and lean organisational structure that mirrors a university research environment, which nurtures innovation. Moreover, the desire to bring about scientific progress also led the companies venture into niche segments, evident by the increase of new orphan and speciality drugs by biotechs over the years. On the other hand, the founders' research-focus and potential need for additional business expertise translated into an openness for collaboration. This also explains why the biotech industry has adopted a network structure and supports regional cluster formation. Moreover, entrepreneurial biotech ventures are oftentimes deemed highly risky undertakings due to the complexity, uncertainty, longevity, and capital intensiveness underlying the research in biotechnology. Thus, establishing partnerships with universities, venture capitalists, consultancy agencies, law firms, and big pharma have become increasingly

important for biotech start-ups (Evens & Kaitin, 2015; Patzelt et al., 2012; Powell, 1996; Schweizer, 2014; Tyagi et al., 2018).

Companies which are nowadays active in the biotechnology industry can be categorised into three distinct types, based on their focus on biotechnology. Entrepreneurial Life Sciences Companies (ELISCOs) encompass the typical entrepreneurial small or mid-sized companies which solely specialise in biotechnology (e.g. biotech start-ups). Extended Core Companies, albeit also being small or mid-sized, do not exclusively operate in biotechnology but attribute more than 50% of their revenues to it. Finally, large (pharmaceutical) companies are the established industry players which are significantly involved in biotechnology, but also very active in other life sciences segments (e.g. big pharma) (Patzelt et al., 2012).

In terms of business models, one can further differentiate between three kinds of company archetypes. Product-oriented biotechs discover, develop, and commercialise biotechnological products such as biopharmaceuticals. Service-oriented biotechs develop and commercialise platform technologies which support other companies in their R&D activities. Hybrid biotechs, a mixed archetype, develop own biotechnological products, but also license proprietary platform technologies to other companies (Patzelt et al., 2012; Tyagi et al., 2018).

3.3 The Need for Cooperation: M&A Motives

The discovery of novel drugs for therapeutic areas of unmet medical need is of growing importance for the competitiveness and prosperity of research-based big pharma. The traditional R&D model of the pharmaceutical industry, however, has not proven sustainable in light of persisting industry challenges (Schuhmacher, Gassmann, et al., 2016). As a result, big pharma companies have long expanded their focus beyond corporate boundaries in their attempt to rejuvenate innovation and stand the pace with scientific and technological progress. Concurrent to a general disaggregation of the pharmaceutical value chain, R&D in particular is being reshaped by the increasingly collaborative behaviour of big pharma, biotechs, and academia (Schuhmacher, Hinder, et al., 2016).

The rise of biotechnology has fundamentally changed the art of drug discovery and is even considered a competency-destroying evolution from a classical pharmaceutical company's perspective (Schweizer, 2005a). Albeit having largely missed out on the new science when it first emerged, the undisputable value of biotechnological innovations has woken the interest of big pharma over the last decades. By collaborating with biotechs, big pharma aims at improving R&D efficiency and boosting innovation through external knowledge souring (Amir-Aslani & Megarbane, 2007; Lange & Wagner, 2019). While big pharma is obviously attracted to the

product pipelines, cutting-edge technologies, and superior innovativeness of small biotech companies, the desire to form alliances is not one-sided. The partnership with big pharma is a means for biotechs to gain a footing in the industry, establish network relationships, and receive the necessary support for further business development. This is especially true for early-growth biotech start-ups, which have not developed into fully integrated companies and thus tend to favour cooperation over direct competition (Gassmann et al., 2018; Khanna, 2012; Patzelt et al., 2007).

The collaboration between big pharma and biotechs can occur in various forms. The choice on partnership mode and scope is highly dependent on the context and corporate strategies. Some typical examples, however, can be highlighted. Young biotech start-ups, for instance, are oftentimes supported by big pharma in their early endeavours through research alliances or corporate venture funding. When research findings turn into promising early-stage products or technologies, big pharma usually tries to enter into licensing agreements with biotechs to access intellectual property. Co-development/co-commercialisation, partial acquisitions with pipeline exclusivity, or full-fledged M&As are more committed partnership modes, which big pharma uses when targeting a biotech's late-stage products and superior R&D capabilities (Amir-Aslani & Megarbane, 2007; Gassmann et al., 2018; Khanna, 2012).

Compliant with a general trend towards consolidation in the pharmaceutical and biotechnology industries, big pharma has increasingly opted to outright acquire innovative small biotechs. This trend has been encouraged by a downward adjustment in biotech company valuations, which were historically inflated, making M&A an even more attractive growth option. Researchers have also observed that after a certain threshold, an increasing number of strategic alliances has a negative effect on R&D output and should thus be complemented by M&As (Schweizer, 2005a, 2014). Moreover, the acquisition of a company can facilitate a degree of collaboration and knowledge transfer hardly achievable in any contract-based setting (Lange & Wagner, 2019). Consequently, big pharma companies often undertake acquisitions that support their core business area and have the potential to make the pharmaceutical company more innovative (Schweizer, 2005a). It has also been found that prior alliance partners are likely to enter into M&As if their corporate strategies align, and that a pre-acquisition alliance can benefit both the post-merger integration as well as the subsequent innovation performance (Al-Laham et al., 2010; Lange & Wagner, 2019).

The above raises the question on what specifically motivates pharmaceutical companies in the pursuit of biotech acquisitions. The topic has been covered in academic research and

much of the general M&A motives have been mentioned, in particular, cost and knowledge synergies, excess capacity, and growth ambitions (Ornaghi, 2009; Rossi et al., 2015). However, more interesting are motives unique to the M&A between big pharma and biotech start-ups. Gassmann et al. (2018, p. 37) provide a comprehensive list of M&A drives for big pharma, which include the "[c]ompensation of revenues losses by blockbuster patent expirations, [t]he explosion of technology-based treatment innovations and core competencies, [t]he need to fill R&D pipeline gaps, [t]he aim to access strategically important IP [intellectual property]." Additionally, Schweizer and zu Knyphausen-Aufsess (2008, p. 142) highlight that biotech acquisitions might enable big pharma "to create internally a research environment that fosters the kind of innovation and discovery necessary to survive in the long run."

Respectively, one needs to investigate the reasons why biotech start-ups enter into M&As with big pharma. The majority of biotechs are private entrepreneurial ventures that are primarily specialised in R&D or R&D technologies for niche markets. Most of these companies are still in early product development stages and highly dependent on VC, capital markets, and the pharmaceutical industry for financing their cost-intensive research projects. The biotech industry has seen only a few companies gain on critical mass and transform into fully integrated drug developers, such as Amgen, Biogen, or Genentech. Due to the high risk and long investment horizon associated with biotech R&D projects, the companies oftentimes struggle to secure the necessary funding required to fully develop and commercialise their innovations. An initial public offering (IPO) is in most cases only a viable option for biotechs if their innovations are already in the close-to-commercialisation stage. Thus, being acquired by big pharma might become an attractive exit strategy for both VC investors and company owners, as it guarantees stability and financial relief (Amir-Aslani & Megarbane, 2007; Jacobsen & Wertheimer, 2010; Rossi et al., 2015). Besides the dire need for capital, biotech start-ups usually also lack the infrastructure, regulatory expertise, and the marketing skill set necessary to successfully progress their drug candidates past the translational phase and into the consumer market. Considering the high attrition rate of drug targets from biotechs in the clinical phases, an acquisition by big pharma would allow them to focus on what they do best, namely research, while also increasing the chances that their innovative ideas are fully realised (Schuhmacher, Hinder, et al., 2016). Moreover, biotechs can become extremely valuable research units for big pharma and might find new R&D tasks arise outside previous focus areas (Khanna, 2012; Lange & Wagner, 2019). Finally, for biotechs which originate as university spin-offs, the ultimate exit via M&A might already be programmed from the start, as some scientist-entrepreneurs

potentially see the company more as a project than a long-term business engagement (Haeussler, 2007).

Considering the manifold motives which prompt big pharma and biotech start-ups to join forces in the form of an M&A, one realises the high expectations big pharma attaches to such deals and which are to be realised in the PMI phase. Schweizer (2005b) argues that these motives can be summarised into short- and long-term orientations, which need to be individually addressed for the design of an integration strategy:

> Proposition 1a. When acquiring biotechnology firms, pharmaceutical companies tend to pursue the short-term motive of improving their market positions by filling their R&D pipelines and gaining potential blockbusters.
>
> Proposition 1b. When acquiring biotechnology firms, pharmaceutical companies tend to pursue the long-term motive of supporting their overall growth strategies by accessing biotechnology know-how and technologies (Schweizer, 2005b, p. 159).

3.4 Industry-Specific Integration Success Framework

The central importance of successful integration management also applies in the context of M&As between pharmaceutical and biotech companies. Even more so considering that innovations and, more importantly, innovative capabilities are the primary value targets in such acquisitions. To accomplish this feat, the idiosyncrasies of the industries, the underlying motives, and the involved company types need to be fully accounted for by the integration strategy. Neglecting the complexity of the situation could lead to suboptimal or undesired integration outcomes and ultimately turn the M&A into a failure (Schweizer, 2012). Encouraged by this train of thought, Schweizer (2005b) developed a hybrid integration approach framework that is tailored to the needs of large pharmaceutical firms (e.g. big pharma) which acquire small biotechs (e.g. biotech start-ups). By following this hybrid approach, the integration strategy accommodates "simultaneous short- and long-term motives/orientations and segmentation at a different pace across different value chain components" (Schweizer, 2005b, p. 1051). Schweizer (2005b) also finds that the application of this industry-specific hybrid framework promotes M&A success.

The rationale behind Schweizer's (2005b) hybrid framework can be explained under the consideration of cultural, human, and organisational integration aspects. Firstly, M&As between small biotechs and large pharmaceutical companies are subject to cultural integration issues. However, the source of such issues is more ascribed to differences in organisational than

national culture. Considering the entrepreneurial spirit and lean organisation of biotechs, traditional big pharma companies could not stand in bigger contrast (Schweizer, 2012). The integration issue of the cultural aspect runs deeper than merely having to bridge the gap in national and corporate cultures. In fact, the entrepreneurial spirit and corporate culture is oftentimes considered "an inherent part of the capabilities of biotech companies" (Schweizer, 2005b, p. 1070). Consequently, the innovative capacity of a biotech is closely interlinked with its specific "biotech culture". Large pharmaceutical companies need to consider this aspect in their integration planning and realise the potential negative consequences of full absorption. Schweizer (2005b) further highlights that in most cases, the biotech's culture changes from entrepreneurial to research-driven with increasing degree of integration.

This shift in the biotech's culture also has an impact on the commitment of target company employees. For the human aspect of integration, Schweizer (2012, p. 649) highlights that "[e]specially in biotechnology M&As, the integration process creates value by preserving, transferring, and applying the tacit knowledge and know-how of employees from the biotech." Therefore, any resulting employee turnover might generate a loss of innovation-critical biotech capabilities. He further notes that the most valuable human capital is provided by employees involved in the R&D processes. As the biotech culture arguably becomes more research-driven after the integration, the standing of the acquired company's key R&D personnel increases, which benefits their retention. This might also explain why oftentimes R&D people remain with the company in the post-acquisition phase, whilst most executive managers decide to leave. Still, pharmaceutical companies are best commanded to promote the retention of key R&D personnel as well as of top managers in order to foster knowledge transfer and, thereby, value creation (Schweizer, 2005b, 2012; Schweizer & Patzelt, 2012). Elaborating on Schweizer's (2005b) statement, one might also consider the entrepreneurial founders of a biotech as key R&D personnel as they were oftentimes the inventors of the original products or technologies.

Finally, integration issues also need to be addressed on an organisational level. Schweizer (2012, p. 650) states that the dilemma which pharmaceutical companies face is that while the acquired biotech needs to be integrated to some degree in order to exploit synergies, this should not come at the cost of "harming their innovative capabilities." Moreover, the short- and long-term motives that prompted the biotech's acquisition need to be addressed differently on organisational levels. In this respect, the knowledge transfer which is facilitated through the integration has to be explained in more detail. Schweizer (2005b, 2012) herein distinguishes between "biotech know-how" and "biotech knowledge." The former refers to the scientific and tactic know-how that forms the biotech's research capabilities and innovative engine. The latter,

on the other hand, describes information located in the biotech company or, more precisely, the innovative findings such as drug targets or technologies which resulted from the biotech's R&D. While in most cases a transfer of biotech knowledge occurs between the target and the acquirer in the post-integration phase, a transfer of biotech know-how is often not even attempted. This is due to the fact that the specific biotech know-how is very deeply rooted in the company's culture, people, and organisation and cannot easily be absorbed by another company without causing value destruction (Schweizer, 2005a; Schweizer & zu Knyphausen-Aufsess, 2008). Thus, Schweizer denotes (2005b, 2012) that while pharmaceutical companies need to receive the accumulated biotech knowledge in order to leverage technologies and further the development and commercialisation of potential drug targets to achieve their short-term motives, they simultaneously need to protect the specific biotech know-how embedded in the company in order to foster long-term innovation and growth. As a result, the integration approach on an organisational level needs to simultaneously combine the principles of absorption and preservation and, thus, follow a hybrid framework (Schweizer, 2012).

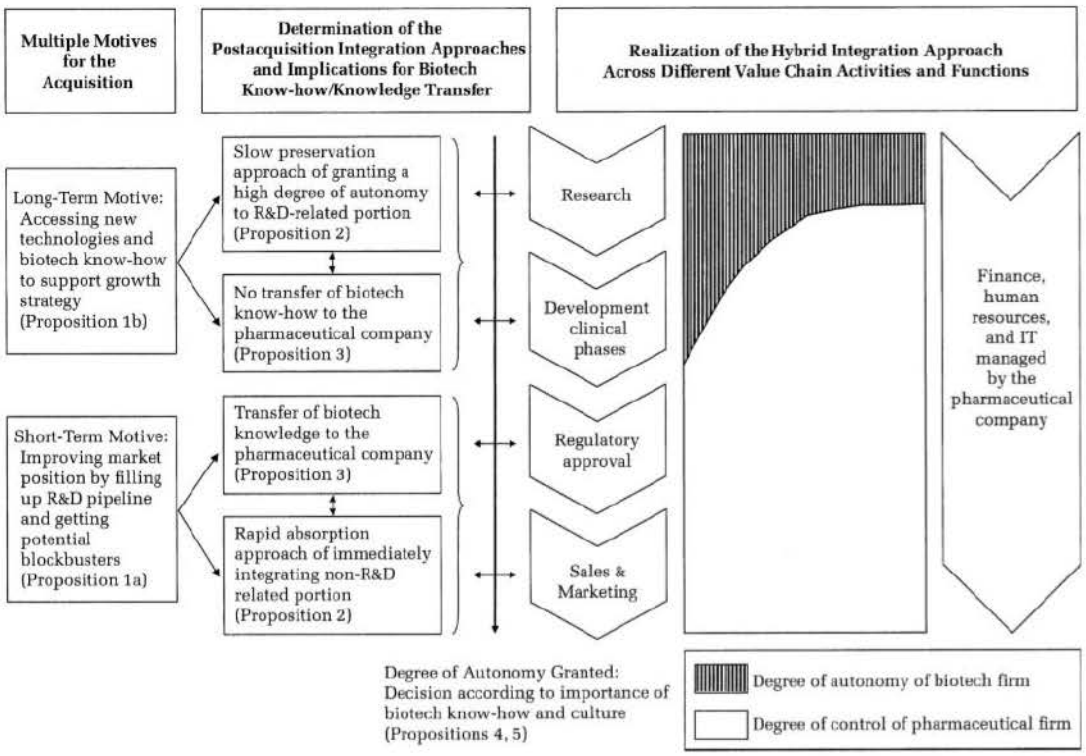

Figure 15: Post-Acquisition Integration Framework: Toward a Hybrid Approach, (Schweizer, 2005b, p. 1067).

Schweizer's (2005b) integration framework prescribes the use of (I) a rapid absorption approach for non-R&D-related value chain components and (II) a slow preservation strategy for the R&D-related components.

Such hybrid arrangements successfully tackle the aforementioned integration issues in that they allow the concurrent achievement of a biotech knowledge transfer and a biotech know-how protection. Consequently, the acquired biotech should remain largely autonomous and independent in their R&D activities as these constitute the company's core competencies. The succeeding value chain components, however, lie in the area of expertise of the pharmaceutical company and should thus be fully absorbed. These components usually comprise late-stage clinical testing and regulatory approval as well as sales and marketing. The same applies to supporting functions such as IT, Human Resources (HR), or Finance as they are typically more advanced and established in the large pharmaceutical company. Schweizer (2005b, p. 1061) further argues that "the degree of autonomy [...] granted differs in each acquisition according to the identified competencies of the biotech company involved." Thus, the more specific biotech know-how exists in the target, the higher is its independence after the acquisition. Based on this rationale, large pharmaceutical companies even go as far as to transform the biotechs into centres of excellence when they recognise R&D superiority (Schweizer, 2005a, 2005b).

4 Research Methodology

The previous chapters gave introductions to the broader theory of M&A (Ch. 2), with emphasis on the PMI phase (Ch. 2.4), and to the subject of M&A in the pharmaceutical and biotechnology industries (Ch. 3.3). Moreover, the industry contexts were given with focus on challenges, trends, and company characteristics (Ch. 3). The paper further highlighted the need and motives for M&As in general (Ch. 2.1 and 2.2) as well as specifically in the context of biotech acquisitions by big pharma (Ch. 3.3). Finally, Chapter 2.5 and Chapter 3.5 presented the generic and industry-specific integration success frameworks based on the theories of Bergamin and Braun (2018) and Schweizer (2005b).

To investigate the PMI SFs for biotech start-up acquisitions by big pharma, a multi-layered approach will be applied both in terms of research scope and research method. Chapter 4.1 presents the methodology for the trend analysis and Chapter 4.2 the one for the PMI analysis of selected case studies. While the case study analysis on PMI SFs remains the main focus of this paper, the preliminary high-level trend analysis will help to situate the cases and findings in the broader context of M&As between big pharma and biotechs.

4.1 Methodology for the Trend Analysis

For the trend analysis, the focus of research will be on M&As which involved Swiss biotechs and big pharma between 2005 and 2019. The goal is to identify patterns in the acquisition of Swiss biotechs by big pharma. The result of this analysis will be used to test the first hypothesis (H1), namely whether there is a strong tendency for "Originators" to acquire "Innovators".

4.1.1 M&A Transaction Identification

In a first step, the M&A transactions which qualify for the broader research scope of this paper (buyer: big pharma / target: Swiss biotech) were identified. Herein, the paper limits the scope to the top 20 big pharma companies in terms of 2019 revenues (Sagonowsky, 2020). Table 1 provides an overview of the ranking of these top 20 pharma companies.

Rank 1 – 5	Rank 6 – 10	Rank 11 – 15	Rank 15 – 20
1. Johnson & Johnson	6. GlaxoSmithKline	11. Bristol Myers Squibb	16. Boehringer Ingelheim
2. Roche	7. Sanofi	12. AstraZeneca	17. Novo Nordisk
3. Pfizer	8. AbbVie	13. Amgen	18. Teva Pharmaceutical Industries
4. Novartis	9. Takeda	14. Gilead Sciences	19. Allergan
5. Merck & Co.	10. Bayer	15. Eli Lilly	20. Biogen

Table 1: The Top 20 Pharma Companies by 2019 Revenue. Own Creation, Based on Sagonowsky (2020).

Subsequently, the historical data on M&A transactions between the biotechnology and pharmaceutical sectors was retrieved from the latest HBM Partners' "Pharma / Biotech M&A Transactions 2005-2019" excel report (HBM Partners, 2020b). In order to identify transactions which involved Swiss biotechs as target and big pharma companies as buyer, the following filters were applied: (1) Target Country = Switzerland, (2) Acquisition Type = Company Sale, (3) Buyer = Top 20 Pharma Companies. The filtering resulted in a set of eleven transactions which occurred between 2005 and 2019 and qualified for the predefined broader scope. These eleven M&As also constitute the data set for the high-level trend analysis in Chapter 5. An overview of the transactions can be found in appendix 10.1.

It is important to highlight that for the trend analysis in Chapter 5, the data was not filtered for start-up companies as these were identified in the course of the analysis and, therefore, could not be prematurely determined.

4.1.2 M&A Classification Procedure

To generate findings for the trend analysis, a high-level desk research was conducted on the buyer, the target, and the acquisition motive. In particular, the following analyses were made:

1. A buyer classification based on business segments/therapeutic areas (Appendix 10.2)
    - Result: strategic archetype classification according to the model of Kurmann Partners (2016)

2. A target classification based on VC funding, value proposition, platform technology, product portfolio, pipeline maturity, and acquisition motive from a buyer perspective (Appendix 10.3)
    - Result: target identity (R&D-focused or fully integrated), start-up identity (VC funding), and target strategic archetype (Innovator) based on own inferences
3. A concluding transaction classification concerning buyer/target archetype constellations and key purpose of the M&A from a buyer perspective (Appendix 10.4)
    - Result 1: transaction categories based on buyer/target archetypes (→ who buys whom?)
    - Result 2: key M&A purpose within each transaction category based on the impact of the M&A on the respective buyer's business segments, therapeutic areas, and value chain (→why?)

The desk research findings which were used to make the trend analysis are provided in the appendixes 10.2 and 10.3.

4.2 Methodology for the Case Study Analysis

For the practical examination, the focus of research will be narrowed down to three selected PMI cases of Swiss biotech start-up acquisitions by big pharma. The aim is to test the theoretical integration success frameworks (Ch. 2.5 and Ch. 3.4) in these practical examinations. Moreover, this paper attempts to identify additional scope-specific PMI SFs through the analysis of best practices that are not fully accounted for by the theoretical success frameworks.

The results of the case studies will help in answering the main research question, namely what the success factors in the post-merger integration of biotech start-ups into big pharma are. Finally, the case studies will also test the second and third hypotheses, namely whether big pharma companies acquire biotech start-ups with the short-term motive to improve market positions by accessing the biotechs' innovations (H2) and the long-term motive to support their overall growth strategy by accessing the biotechs' innovative capacities (H3).

4.2.1 Case Study Selection

From eleven M&A transactions that qualified for the broader research scope of this paper, three were selected for the case study analysis on PMI SFs. These companies had to fit the smaller research scope in that they qualified as a start-up (buyer: big pharma / target: Swiss biotech start-up). The selected M&A cases were proposed by Christoph Bieri, an expert in pharma M&A and managing partner at Kurmann Partners. The recommended cases proved very suitable for the study and were therefore adopted.

The selected M&As for the case study analysis on PMI SFs are:

- GlycArt Biotechnology AG and Roche (2005)
- ESBATech AG and Alcon / Novartis (2009/2010)
- Actelion Ltd. and Johnson & Johnson (2017)

These M&As form a representative and well-balanced sample for the PMI analysis due to the individual constellations in target company type, buyer archetype, M&A context and motives, and post-acquisition outcome. This will become apparent in the course of the trend analysis in Chapter 5 and the practical examination in Chapter 6.

4.2.2 Desk Research and Interviews

The chosen research approach is a combination of desk research and interviews. The desk research focused primarily on press releases and newspaper/journal articles as well as company websites, reports, and publications. This research type was undertaken first and was mostly completed prior to the interview phase. The interviews constituted the essential second part of the research. They were especially important for the qualitative nature of the study and the generally limited information publicly available on PMI, especially in the case of private and small company acquisitions. Hence, interviews with at least one representative of each target company were conducted.

The choice of interviewing representatives of the target companies, given that they remained with the company after the M&A, makes sense for three main reasons. Firstly, target company representatives which were involved in the PMI phase are better identifiable than those from the buyer's side. Secondly, the target's founders or executives most likely have comprehensive knowledge on the biotech's situation before, during, and after the acquisition. Thirdly, target company representatives are well-suited to judge the quality of the PMI phase as they were directly affected by the applied integration strategies and management techniques. Table 2 provides an interview overview, while the transcriptions can be found in appendix 10.5.

Interview Partner Information				**Interview Details**	
Name	**Target**	**Role in Target**	**Current Positions/Organisation**	**Date**	**Type**
Dr. Pablo Umaña	GlycArt	Co-Founder, Chief Scientific Officer*, Head Roche Glycart/RICZ	Head of Research, Roche Glycart AG Head Cancer Immunotherapy Discovery, Roche Innovation Center Zurich	29.4.2020	Video Conference
Dr. Dominik Escher	ESBATech	Co-Founder, Chief Executive Officer*, Head ESBATech**	Partner Pureos Bioventures Executive Chairman CDR-Life Inc. President Swiss Biotech Association	21.4.2020	Telephone
Dr. Alcide Barberis	ESBATech	Co-Founder, Chief Scientific Officer***	President/Owner LCID Consulting CEO Mabylon AG	16.4.2020	Telephone
Nicholas Franco	Actelion	Executive Vice President & Chief Business Development Officer (EVP & CBDO)	EVP & CBDO, Allschwil Site Head, Actelion Pharmaceuticals Ltd	1.05.2020	Written Questionnaire
*until M&A **until 2016 (left company) ***until 2006 (left company)					

Table 2: Overview of Interview Partners. Own Creation.

The interview partners were identified after a preliminary desk research and contacted via email. Due to the current coronavirus pandemic, the interviews could not take place as an in-person meeting and, thus, had to be done in a telephone, videoconference, or written format.

For conducting the interviews, except in the case of Actelion, a semi-structured approach was applied in that the questions were pre-drafted but deviated if the conversation required it. The semi-structured interviewing technique is especially well-suited for a qualitative data collection due to its flexibility (Miles & Gilbert, 2005). In the case of Actelion, a written questionnaire was provided to the interviewee as this was the preferred format for the company. All interview questions were individually tailored to the interview format, the specific context of the M&A as well as the information gaps identified during the desk research phase. Therefore, the questions are case-specific and differ to some extent.

The oral interviews were transcribed from audio recordings, but the sentence structure and grammatical errors were adjusted in some cases and gap fillers, such as "uhm", were omitted, given that the meaning of the statement was thereby not affected. This allowed to improve the textual flow and reading experience of the transcribed interviews.

4.2.3 Practical Examination Procedure

The practical examination of each PMI case study will be divided into three parts: Contextual Analysis, Post-Merger Integration Analysis, and Case Assessment: PMI SFs.

The contextual analysis will first provide an overview of the target company's history and situation up to the point of acquisition, then elaborate on the transaction and the specific M&A motives of both target and buyer, and finally present information on what happened with the target company after the integration. The post-merger integration analysis will separately discuss the integration strategy, the integration management, and the value creation resulting from the integration. This analysis will be guided by the consolidated PMI SFs framework derived from theory, which is presented in the next section. The post-merger integration analysis will directly interpret the desk research and interview findings and confirm or negate the fulfilment of the individual PMI SFs. Conclusively, a case assessment on the basis of this consolidated PMI SFs framework will be made to validate the applicability of the generic and industry-specific integration success frameworks to the scope. Moreover, best practices will be highlighted which could qualify as newly identified scope-specific PMI SFs. The individual case studies are presented in Chapter 6. The discussion of the findings from the trend analysis and the case study analysis takes place in Chapter 7.

4.2.4 Consolidated PMI SFs Framework for Practical Examination

A consolidated framework was created for the case assessment, which encompasses the PMI SFs from the theoretical integration success frameworks introduced in Chapter 2.5 and 3.4:

A. Five Factors that Make or Break an Integration Project (Bergamin & Braun, 2018)
B. Performance Transformation Concept (Bergamin & Braun, 2018)
C. Hybrid Integration Approach Framework (Schweizer, 2005b)

Table 3 depicts the consolidated framework which will be tested in the case studies. It assigns the generic (A & B) and the industry-specific (C) PMI SFs to the three defined dimensions of the post-merger integration analysis.

Integration Strategy		**Integration Management**		**Value Creation**	
Generic PMI SFs		*Generic PMI SFs*		*Generic PMI SFs*	
Appropriate Depth of Integration (part of Implement Performance Transformation)	B	Leading Figures	A	Synergy Exploitation	A
Industry-Specific PMI SFs		Institutionalise Integration Office Responsibility	B	Implement Performance Transformation	B
Realisation of the Hybrid Integration Approach across Different Value Chain Activities and Functions (R&D vs. Non-R&D): • R&D: Research, Clinical Development (until Regulatory Approval) • Non-R&D: from Regulatory Approval onwards, Sales & Marketing • Non-R&D: Support Functions (Finance, HR, IT)	C	Availability of Resources	A	Exploit the Momentum of Change	A
		Take Care of Talents	B	Exploit Growth Dynamics	B
		Project Management	A	*Industry-Specific PMI SFs*	
		Introduce Integration Monitoring	B	Achievement of Short-Term Motive: Innovations for Boosting Market Position by Knowledge Transfer	C
				Achievement of Long-term Motive: Innovative Capacity for Boosting Growth by Know-How Preservation	C
Research & Development: Limited to No Integration • Preservation Approach: High Degree of Autonomy to R&D-Related Portion • No Transfer of Biotech Know-How	C				
Regulatory Approval/Sales & Marketing + Supporting Functions: Full Integration • Absorption Approach: Control of Pharma over Non-R&D-Related Portion, Transfer of Biotech Knowledge	C				

Table 3: Consolidated Theoretical Post-Merger Integration Success Factors Framework. Own Creation.

5 Trend Analysis: The Swiss Market for Biotech Acquisitions

According to the recently published data by HBM Partners (2020b), 1,109 M&A transactions between the pharmaceutical and the biotechnology sector were recorded for the time period of 2005 to 2019. Thereof, 981 were company sales and 128 were asset or division deals. A total of 40 transactions were recorded with Switzerland as the target's country, 34 of which were company sales and 6 of which were asset or division deals.

Considering only the transactions that involved the top 20 big pharma companies as buyer (Sagonowsky, 2020), 13 M&As with Switzerland as the target's country can be identified. Excluding asset and division deals, which concerned the Novartis and GlaxoSmithKline asset swap in 2014 and their joint venture deal in 2018, eleven company sale transactions remain for the trend analysis. One of these M&A was an indirect Swiss biotech purchase by big pharma, as the target (ESBATech) was first purchased by a non-big pharma, non-biotech company (Alcon), which in turn was later on fully acquired by a big pharma company (Novartis). An overview of the selected transactions, including the corresponding deal information provided by the HBM Partners dataset, can be found in appendix 10.1.

Table 4 depicts the eleven M&As and presents the most important deal information. This information is based on the original HBM Partners dataset, with slight corrections for identified inconsistencies (see Appendix 10.1). The table further includes some findings from the target and buyer classifications which can be found in appendix 10.2 and 10.3, respectively. In terms of target identity, the differentiation between R&D-focused and fully integrated companies is primarily made on the basis of their value chain coverage. Moreover, companies with a single commercial product are also considered primarily R&D-focused if they offered the product in only a very limited number of geographic markets (Fumapharm) or sold the option to produce and commercialise the product to an external partner (Speedel). For the classification of the buyer's strategic archetype, the model by Kurmann Partners was applied.

Acquisition Year	Swiss Target	Buyer	Deal Value ($m)	Target Ownership	Target: Identity	Buyer: Strategic Archetype
2005	GlycArt	Roche	181	Private	R&D-focused	Originator
2006	Fumapharm	Biogen Idec	500	Private	R&D-focused	Originator
2008	Speedel	Novartis	880	Public	R&D-focused	Originator
2010	ESBATech (part of Alcon)	Novartis				
> 2009	ESBATech	Alcon	589	Private	R&D-focused	Point-of-Call Specialist
> 2010	Alcon	Novartis	41,200	Public	Fully Integrated	Originator

2011	Nycomed	Takeda	13,680	Private	Fully Integrated	OTC / Consumer Health (→ transitioning towards Originator)
2013	Okairos	GlaxoSmithKline	323	Private	R&D-focused	OTC / Consumer Health (→ transitioning towards Originator)
2014	OncoEthix	Merck & Co.	375	Private	R&D-focused	Originator
2015	GlycoVaxyn	GlaxoSmithKline	190	Private	R&D-focused	OTC / Consumer Health (→ transitioning towards Originator)
2017	Actelion	Johnson & Johnson	30,000	Public	Fully Integrated	OTC / Consumer Health
2019	Therachon	Pfizer	810	Private	R&D-focused	Originator (also OTC / Consumer Health and Low-Cost Provider)
2019	Amal Therapeutics	Boehringer Ingelheim	366	Private	R&D-focused	Originator

Table 4: Swiss Biotech Acquisitions by Big Pharma (2005 - 2019). Own Creation, Partially Based on HBM Partners (2020b).

The table shows that the majority of M&As was undertaken by Originators, as six out of eleven deals can clearly be identified for this strategic archetype. Moreover, if only the innovative pharmaceuticals division of Pfizer is considered, then this buyer also classifies as Originator, which increases the number of deals for this archetype to seven. Finally, all biotech acquisitions by Originators involved targets which are R&D-focused companies.

The remaining four M&As can be associated with OTC / Consumer Health companies. However, the analysis found evidence that two of the three companies classified under this strategic archetype have transitioned or are transitioning towards the Originator business model, as both Takeda and GlaxoSmithKline (GSK) have changed their strategies over the years and started to concentrate on the R&D of innovative medicines. This trend is further supported by recordings of portfolio divestments from these companies concerning non-Originator business segments (see appendix 10.2). In terms of target identity, OTC / Consumer Health companies purchased R&D-focused as well as fully integrated biotech companies. GSK was the buyer in both R&D-focused biotech acquisitions accounted for by the OTC / Consumer Health archetype.

Table 5 provides a more detailed overview of the Swiss biotechs which were acquired by big pharma. The information used to analyse and classify the target companies can be found in appendix 10.3.

Biotech Target Company	Stage of Lead Product	Business Model (Product and/or Platform)	Start-Up Qualifier (VC Funding)	Innovator Qualifier (Value Chain Focus: R&D)	Target: Strategic Archetype
GlycArt	Preclinical	Hybrid	VC-backed	R&D	Innovator
Fumapharm	Market	Product-Oriented	-	R&D + Market	Innovator
Speedel	Market	Product-Oriented	Initially VC-backed	R&D	Innovator
ESBATech	Phase 1	Hybrid	VC-backed	R&D	Innovator
Nycomed	Market	Product-Oriented	-	Manufacturing + Market	Manufacturing & Sales Expert
Okairos	Phase 2	Hybrid	VC-backed	R&D	Innovator
OncoEthix	Phase 1	Product-Oriented	VC-backed	R&D	Innovator
GlycoVaxyn	Phase 1	Hybrid	VC-backed	R&D	Innovator
Actelion	Market	Product-Oriented	Initially VC-backed	R&D + Market	Innovator
Therachon	Phase 1	Product-Oriented	VC-backed	R&D	Innovator
Amal Therapeutics	Preclinical	Hybrid	VC-backed	R&D	Innovator

Table 5: Swiss Biotech Targets of Big Pharma M&As (2005 - 2019). Own Creation.

Five out of eleven Swiss biotechs acquired by big pharma had a hybrid business model in that they possessed both a platform technology and product candidates in the R&D pipeline. The other six biotechs were mainly product-oriented, and no information was found on any special proprietary technology. In regard to start-up identification, nine companies are reported to have had VC funding in the past, whereof seven were still VC-backed at the time of acquisition. The classification of Innovators was made on the basis of value chain focus. A distinction between value chain focus and value chain coverage has to be made in this respect. In order to qualify as an Innovator, this paper argues that R&D should be one of the core strengths of the company and it should be known as the originators of its innovations. Therefore, Innovators can include fully integrated companies, but they exclude companies which primarily fill their R&D pipelines through external partnering. Consequently, Nycomed, which is heavily specialised in manufacturing, marketing, and sales and reportedly focuses on in-licensing and collaboration in its R&D, does not clearly classify as an Innovator (see appendix 10.3). Conclusively, only ten of the acquired biotechs can be considered Innovators.

The following tables provide an overview of the identified three transaction categories, namely "Originator acquires Innovator", "OTC / Consumer Health acquires Innovator", and "OTC / Consumer Health acquires Manufacturing & Sales Expert."

Additionally, to provide some explanation for the trend in biotech M&As, a high-level analysis on the strategic purpose of the acquisition was made. Firstly, the most important statements on M&A motives were collected and can be found in appendix 10.3. Secondly, an

analysis of the acquisitions' impact on business segments, therapeutic areas, value chain expertise, and geographic market coverage was made on the basis of information presented in appendix 10.2 and 10.3. The overview of this analysis is found in appendix 10.4.

Originator acquires Innovator	
Hybrid Target	• Roche → GlycArt (Start-up) • Boehringer Ingelheim → Amal Therapeutics (Start-up) • Novartis → (Alcon) → ESBATech (Start-up)
Product-Oriented Target	• Biogen → Fumapharm • Novartis → Speedel (Start-up) • Merck & Co → OncoEthix (Start-up) • Pfizer → Therachon (Start-up)
Key Purpose: M&A to strengthen R&D in core business segment & core therapeutic area	

Table 6: M&As in the Originator Acquires Innovator Category. Own Creation.

For six out of the seven M&As in this category, the analysis showed that the overall motive of Originators to acquire Innovators is to strengthen the R&D expertise and pipelines in the core business segment of pharmaceuticals. Moreover, there is a clear trend of acquiring an Innovator that specialises in the priority therapeutic area of the respective Originator (e.g. oncology).

In the case of Novartis and ESBATech, the transaction can definitely be seen as a strengthening of Novartis' R&D expertise and pipeline for the core pharmaceutical business segment. However, as this was an indirect acquisition, it is important to elaborate on the specific purposes of both M&As individually. Alcon, a Point-of-Call Specialist for eye care, acquired ESBATech in order to strengthen its R&D expertise and pipeline in the pharmaceutical business segment of ophthalmology. For Novartis, the acquisition of Alcon was rather a means of diversification as the deal concerned a non-core therapeutic area of Novartis and added two new ophthalmic business segments outside of pharmaceuticals to the big pharma company.

OTC / Consumer Health acquires Innovator	
Hybrid Target	• GlaxoSmithKline – Okairos (Start-up) • GlaxoSmithKline – GlycoVaxyn (Start-up)
Key Purpose: M&A to strengthen R&D in core business segment & core therapeutic area	
Product-Oriented Target	• Johnson & Johnson – Actelion (initially a Start-up)
Key Purpose: M&A to expand franchise portfolio in core business segment with new therapeutic area	

Table 7: M&As in the OTC / Consumer Health Acquires Innovator Category. Own Creation.

The strategic purpose of the Innovator acquisitions by GSK is equal to the one of Originators, which might further provide evidence for the company's archetype transition. GSK acquired both companies to strengthen its R&D expertise and pipeline in its priority business segment of prophylactic and therapeutic vaccines. The acquisitions were especially attractive for GSK due to the proprietary technologies the biotechs had developed.

For Johnson & Johnson, a classical example of the OTC / Consumer Health archetype, the main purpose of the acquisition was to expand its pharmaceutical business segment by adding a sixth therapeutic area. Acquiring Actelion's strong pulmonary arterial hypertension franchise, therefore, allowed the big pharma company to diversify its pharmaceutical arm. However, as the acquisition excluded early-stage R&D assets, which were spun-off into a new company, the strategic fit is more given from a market than from an R&D perspective.

OTC / Consumer Health acquires Manufacturing & Sales Expert	
Product-Oriented Target	• Takeda – Nycomed
Key Purpose: To optimise the value chain and expand market reach of new core business segment for various therapeutic areas	

Table 8: M&As in the OTC / Consumer Health Acquires Manufacturing & Sales Expert Category. Own Creation.

In the case of Takeda, the key purpose of the M&A was to optimise its value chain activities, especially in terms of manufacturing and commercialisation, as well as to strengthen its market presence in Europe and emerging markets. Takeda benefits from Nycomed's expertise in later-stage value chain steps in that its new priority business segment of pharmaceuticals is supported by improved production and commercialisation capabilities.

As mentioned in Chapter 4, the M&A transactions of Roche/GlycArt, Novartis/ESBATech, and Johnson & Johnson/Actelion were selected for the case study analysis on PMI SFs. This case study selection is highly representative of the aforementioned trends in that it includes two hybrid R&D-focused biotechs which were directly (GlycArt) or indirectly (ESBATech) acquired by an Originator archetype. Albeit adding a level of complexity to the analysis when studying an indirect M&A, it also adds more relevance to the PMI analysis as M&As oftentimes occur in rather difficult context settings. Moreover, the case study of Actelion will allow to evaluate potential differences in PMI SFs between young R&D-focused hybrid biotech companies and mature product-oriented fully integrated biotechs as well as between the archetypes of Originator and OTC / Consumer Health as buyers. Together, these M&As form a well-balanced sample for the case study analysis on PMI SFs.

6 Case Study Analysis: Post-Merger Integration Success Factors

This chapter presents the case study analysis for GylcArt and Roche (Ch. 6.1), ESBATech and Alcon/Novartis (Ch. 6.2), and Actelion and Johnson & Johnson (Ch. 6.3).

6.1 GlycArt Biotechnology AG and Roche

6.1.1 Contextual Analysis

6.1.1.1 Pre-Acquisition Context

GlycArt Biotechnology AG (henceforth "Glycart"), a privately held Swiss biotech start-up, originated as a spin-off from the Swiss Federal Institute of Technology (ETH) in 2001 after its founders, Pablo Umaña (CSO) and Joël Jean-Mairet (CEO), had competed in the ETH/McKinsey business plan competition in 2000 and successfully attracted VC investments. Until 2005, the Schlieren-based company had gone through several financing rounds (total capital raised: CHF 23 million) and grown from three to approximately 30 employees (Johnson, 2018; Swiss Broadcasting Corporation, 2005).

Glycart specialised in the field of monoclonal antibodies with particular focus on their therapeutic application in oncology. The company had developed a proprietary technology platform, GlycoMAb, which allowed the genetic engineering of antibodies and enhanced their efficacy in stimulating the immune system and attacking T-cells (Wessel, 2005; William Reed, 2005). Glycart used its technology to develop its own GlycoMAb-enhanced new generation of antibodies (Global Life Science Ventures, 2005). The company had several drug candidates in the pipeline, including its lead compounds GA101 (anti-CD20[1]) and GA201 (anti-EGFR), both in the preclinical stage at the point of acquisition (Umaña, 2020).

The Swiss biotech start-up was mostly focused on R&D. It had partnered with Lonza Group AG for the contract manufacturing of the production cell lines of its antibodies. Besides advancing its own drug pipeline, Glycart also collaborated with academia and biotech/pharma companies on external R&D projects, providing its expertise and technology to help test and improve the potency and efficacy of other drug candidates (Gilde Healthcare, n.d.; Umaña, 2020). For instance, in late 2004, the company entered into a technology licensing agreement and R&D partnership with F. Hoffmann-La Roche AG (henceforth "Roche") (LUMITOS, 2004; Wessel, 2005). As most of the research collaborations of Glycart were on early stage R&D projects, which often generate only a limited revenue inflow, the company majorly relied on its VC funding for financing its corporate and drug discovery activities (Umaña, 2020).

[1] Indication of molecules targeted by drugs is given for identification purposes, but will not be medically explained.

6.1.1.2 Acquisition: Deal and Motive

The acquisition of Glycart by Roche for a price of CHF 235 million in cash was announced on 19 July 2005 and completed shortly afterwards. The deal was the result of a trade sale process with 16 suitors, which had originally been kicked-off by an unsolicited bid from another pharma company (Johnson, 2018; Roche, 2005; Umaña, 2020). The acquisition agreement included a two-year trial period with temporary contracts for all Glycart employees (Umaña, 2020). Former Glycart CEO Jean-Mairet decided to leave the company upon acquisition to pursue new opportunities, such as founding the biotech VC firm Ysios Capital in 2008 (Johnson, 2018).

Pablo Umaña (2020, Appendix 10.5.1) reveals that "[f]rom the very start of the company we thought that an M&A was one of the exit options." The unsolicited third-party offer, however, was actually what triggered Glycart to screen the market for potential buyers. Roche, as a global leader in oncology, biopharmaceuticals, and antibodies, turned out as the perfect strategic fit for the biotech start-up. In fact, Roche had somewhat of a monopoly in the anti-CD20 antibody market with its first-in-class product MabThera/Rituxan. As Glycart's GA101 was a second generation anti-CD20 antibody, which at some point would advance into the clinical phase where it would be compared to MabThera as standard of cure, the partnership with Roche was a logical move. Moreover, Roche's overall philosophy and commitment to R&D made it an attractive suitor for Glycart (Umaña, 2020). Upon the M&A announcement, Jean-Mairet (as cited in Roche, 2005) stated, "Roche's outstanding capabilities in biopharmaceutical R&D, manufacturing and commercialisation will give our product candidates and technologies an excellent opportunity to realise their full potential."

According to Wessel (2005), Roche's motivation to participate in the auction process was "to secure exclusive rights to the antibody-boosting technology." The strategic advantages of GlycoMAb from a business perspective are manifold, including therapeutic window expansion, attrition mitigation, life cycle management, and product profitability (Swiss Biotech Association, 2019a). Roche's then-CEO Franz Humer (as cited in Roche, 2005) stated, "we are excited about this significant addition of cutting-edge technology to our R&D organization." Moreover, Roche also gained access to Glycart's antibody pipeline, in particular GA101, which was one of the most promising next generation anti-CD20 drug candidates at that time, potentially even superior to MabThera. Umaña mentions GA101 as a major driver of the M&A from Roche's perspective (Umaña, 2020). In more general terms, Humer (as cited in Roche, 2005) stated, "[t]his acquisition is an excellent strategic fit with our Therapeutic Protein Initiative and our focus on developing clinically differentiated proteins and antibodies for areas of unmet medical need, such as oncology." Recognising early the value potential of Glycart,

Roche acquired the preclinical-stage company with all its employees as a long-term strategy to strengthen its drug pipeline and R&D capabilities in the priority areas of therapeutic antibodies and oncology (Roche, n.d.-c; Wessel, 2005). Hence, both short- and long-term M&A motives are given for Roche's acquisition of Glycart.

6.1.1.3 Post-Acquisition Context

Nowadays, Roche Glycart AG operates as an innovation centre and centre of excellence within the Roche Pharma Research and Early Development (pRED) organisation (Roche, n.d.-a). To foster diversity and innovation, Roche maintains a network of R&D centres located across the globe. The pRED organisation is one of the three separate R&D units of Roche, next to Genentech Research and Development (gRED) and Chugai (Roche, n.d.-e). The pRED unit is staffed with more than 2,200 scientists and consists of seven autonomous Roche Innovation Centers, one of which is the Roche Innovation Center Zurich (RICZ), namely Roche Glycart (Roche, n.d.-f). The Schlieren-based RICZ is headed by Pablo Umaña and has grown to over 180 employees, occupying a 10-story research complex. The majority of the Glycart employees report into the global functions of Large Molecule Research and Oncology Discovery. RICZ is a core biotechnology site and antibody/protein engineering powerhouse for Roche and has also become the Center of Excellence for Cancer Immunotherapy (Roche, n.d.-a).

GlycoMab remains as one of the key antibody engineering technologies of Glycart and the company's lead candidate GA101 (Obinutuzumab, labelled RG7159 by Roche) was successfully launched to the market (Umaña, 2020). After the clinical trial phase under Roche, Obinutuzumab was approved in 2013 by the FDA and in 2014 by the EMA for the treatment of Chronic lymphocytic leukaemia (EMA, n.d.; HBM Partners, 2020a). The FDA granted Obinutuzumab the approval under priority review, orphan drug status, and, as the first drug ever, under the breakthrough therapy designation (HBM Partners, 2020a). Obinutuzumab has since been approved for the treatment of follicular lymphoma and is currently in clinical development for two additional indications, lupus nephritis and frontline indolent non-Hodgkin's lymphoma. Obinutuzumab is sold as a prescription drug under the trade name Gazyva/Gazyvaro in more than 70 countries (Roche, n.d.-b, 2020). At the point of FDA approval, Gazyva was forecasted to achieve peak sales of USD 1.7 billion, therefore having blockbuster potential (HBM Partners, 2020a). While the so-far generated revenue from Gazyva is falling short of this expectation, Roche is anticipating further sales growth in the future, especially through the new treatment indication for lupus (Miller, 2019; P. Taylor, 2018).

6.1.2 Post-Merger Integration Analysis

6.1.2.1 Integration Strategy

Roche's approach to structuring its R&D activities aims for differentiation and innovation by encouraging diversity in science, autonomy, and empowerment, but also collaboration and knowledge sharing (Humer, 2006; Roche, n.d.-d). This philosophy also finds reflection in Roche's approach to post-merger integration (Aiolfi, 2013). Similar as in other M&As, Roche tried to integrate Glycart in a way that allowed for an optimum balance between independence and coordination (Umaña, 2020).

The organisational integration of Glycart transpired to some extent in stages. Initially, the company was placed under a two-year trial period. At the beginning of this period, Glycart primarily focused on its existing drug candidates, platform technology, and molecular biology research with the goal of speedily advancing its projects into the clinical-stage and facilitating the knowledge transfer to the related R&D functions in Roche. Besides furthering its own R&D, Glycart began to support on Roche's other antibody projects with its GlycoMAb technology. In addition, Glycart capitalised on its expertise in protein engineering and became the in-house provider of this technology service within Roche. Thereby, Glycart became fully integrated into the pRED function for Oncology Discovery as well as the Therapeutic Protein Organisation, nowadays called Large Molecule Research. After the initial trial-period, Glycart sought to significantly broaden its therapeutic approaches and expertise, which fostered its gradual development into a dedicated Centre of Excellence for Cancer Immunotherapy within pRED (Umaña, 2020).

The pRED unit covers the discovery and preclinical phase as well as the initial two clinical phases of the drug discovery process, that is early research to clinical proof of concept (PoC) (Roche, n.d.-e). As Glyart was already mainly focused on preclinical R&D before the M&A, the company perfectly matched the value chain focus of pRED. Moreover, due to the company's existing expertise in protein engineering, it also provided a strong fit with Roche's Large Molecule Research organisation (Umaña, 2020).

As Glycart did not have own expertise or capabilities in the value chain steps of late-clinical development, manufacturing, and marketing and sales, these areas of work were fulfilled by Roche upon acquisition. In terms of supporting functions, Glycart largely kept its local management for finance, IT, and HR. For HR, the initial service, which Glycart consulted from an external provider prior to the M&A, was maintained for some time to smooth the transition into Roche's HR and establish an internal local HR manager. However, all these

employees were fully embedded in Roche's global support function organisations, thereby operating as localised counterparts with double reporting lines (Umaña, 2020).

In line with Roche's R&D philosophy, Glycart was granted a high level of operational autonomy and, therefore, established as a self-contained innovation centre and, later, as a centre of excellence. Umaña's leadership was maintained and all employees remained located in Schlieren, thereby protecting pre-established relationships and the modus operandi within the company. Moreover, Glycart was given a high degree of independence, which allowed it to retain its entrepreneurial spirit and biotech culture (Umaña, 2020). Consequently, the biotech know-how was not only preserved, but also allowed to flourish and expand.

To facilitate knowledge transfer, Glycart started to closely interact with other parts of Roche from the very beginning. Its employees quickly became part of global joint research teams, collaborating with the other innovation centres and R&D functions across the globe. Moreover, Glycart employees remained involved in later-stage value chain steps to further support knowledge sharing. Similarly, employees from other global pRED functions were co-located with Glycart to facilitate an improved collaboration. Finally, Roche and Glycart employees had the possibility of redeployment in both directions (Umaña, 2020). These measures not only enabled knowledge transfer, but also aided in the process of cultural approximation and identification with Roche as a parent organisation.

Conclusively, Glycart was integrated as an autonomous and self-contained innovation centre to preserve its biotech know-how and culture, while operating very interactively with other parts of Roche to facilitate proper knowledge transfer and amalgamation, especially as Glycart broadened its research breadth and strengthened its expertise in immunotherapy.

6.1.2.2 Integration Management

The integration planning commenced in the later stages of the negotiation phase, once it became certain that Roche was the preferred suitor and that the companies would enter into an M&A agreement. Before the closing of the acquisition, a high-level integration strategy was formulated, covering broader-term aspects, such as the trial period, the organisational integration, the ways of working within Roche, and the future task areas of Glycart. After the acquisition agreement was signed, an immediate planning of all the detailed integration aspects occurred (Umaña, 2020). Hence, early strategic preparation for the integration phase was given.

For the integration management, a dedicated integration taskforce compromising both Glycart and Roche representatives was formed to coordinate all aspects of the integration. The

integration responsibilities were clearly assigned and both parties were involved as equal partners. Some of Glycart's pre-acquisition collaboration contacts from Roche, which already took part in the due diligence, joined the integration taskforce (Umaña, 2020). From Roche's side, the integration management was especially supported by the involvement of a key figure, namely the head of R&D at Roche. According to Umaña (2020), he was very committed to Roche's philosophy of maintaining diversity and achieving a balance between independence and coordination. He therefore ensured a clear vision and alignment in the top management on what the spirit of Glycart's integration should be. He also provided Umaña with direct access to him and helped in resolving issues during the integration phase (Umaña, 2020). Moreover, Umaña's retention and engagement in the integration planning and management arguably ensured the support of the target's key promoter. Conclusively, the integration management allowed for the involvement of leading figures from both companies and the integration responsibilities were clearly assigned and institutionalised.

The integration process was managed with proper progress monitoring and complete transparency. The integration on both the strategic as well as operative level proceeded according to plan and without major challenges. Regular reports had to be given to governance bodies in Roche for progress tracking. The overall alignment at the top level and clear communication of a shared vision for Glycart's role within Roche fostered commitment and clarity towards the integration plan as well as a swift resolution of potential integration roadblocks. Talent management and knowledge transfer were especially enabled through the collaborative nature during the integration management as well as more generally through the creation of global joint teams and the redeployment opportunities within Roche (Umaña, 2020).

The strategic decision to stipulate a two-year trial period was arguably also advantageous for the integration management. On the one hand, it hindered any disruption to Glycart's day-to-day operations and facilitated a focused and prioritised team effort on project advancement. On the other hand, it provided both parties with the time and room to become acquainted, recognise additional synergies, and develop ideas for Glycart's future role in the company. Despite having the potential of causing uncertainty among Glycart employees, Roche's transparent and committed behaviour mitigated this risk early on (Umaña, 2020). In addition, it arguably also supported the integration monitoring in that it established some form of timeline, milestones, and post-acquisition review. Therefore, the prolonging of the integration process through this trial period benefited resource management and project monitoring.

Shortly after the trial period, Glycart proposed a plan to expand its research operations and diversify its expertise in cancer immunotherapy. This gave way to the organic growth and further integration of Glycart within Roche's R&D organisation. This process was mainly driven by Glycart, but strongly facilitated by Roche's management, which displayed openness and support towards the company's ideas and ambitions (Umaña, 2020). Umaña (2020) states that "at the high level, there was always this vision of making the most of the collaboration."

6.1.2.3 Value Creation

The acquisition of Glycart by Roche offered plenty of sources for value creation, which were exploited during the post-merger integration phase.

The combination of the two companies provided already synergistic effects purely on the basis of value chain management. By integrating Glycart as an innovation centre, the company could continue to focus on its core competencies in R&D, while benefiting from Roche's complementary and superior expertise in the value chain steps of clinical development, manufacturing, and marketing and sales (Umaña, 2020). Moreover, Glycart's R&D efforts were further supported by an improved access to funding, infrastructure, and supplementary knowledge within Roche. Through the combined value chain expertise, the success probability and eventual market potential of Glycart's drug discovery programs were enhanced. The addition of Glycart's innovation prowess also raised Roche's chances of finding new promising drug candidates for its R&D pipeline (Umaña, 2020). This, in turn, could potentially offset some of the big pharma's productivity and overcapacity issues. When focusing only on R&D, the addition of Glycart's expertise, technologies, and services also benefited other projects of Roche, especially due to the collaborative nature of Roche's R&D organisation, which actively promotes knowledge sharing and cross-fertilisation of ideas (Umaña, 2020). Hence, the overall innovation power of Roche's R&D organisation was increased. In sum, the combinational synergy potential of the acquisition was exploited through an optimal division of work based on the respective value chain expertise and a culture of collaboration in R&D.

Moreover, the integration of Glycart as a new pRED Innovation Center and Center of Excellence for Cancer Immunotherapy further expanded Roche's capabilities in biotechnology and to some degree transformed its approach to oncology research and drug development (Umaña, 2020). The transformation began with the application of the GlycoMab technology for other R&D projects and increased through Glycart's in-house provision of the protein-engineering service and particularly through its expanding expertise in cancer immunotherapy. According to Umaña (2020), "at that time the cancer immunotherapy field was just starting to

emerge, but today, it is one of the hottest areas in the field." The transformation is further reflected in Glycart's contribution to Roche's pRED pipeline. Umaña (2020) highlights that "within the pRED part of the organisation, which is one third of the organisation, cancer immunotherapy has a major part of the oncology portfolio, and we are mainly responsible for that." He further elaborates that "a lot of the strategy and the drug candidates currently in the pipeline for cancer immunotherapy have been born out of this original effort from Glycart." Consequently, transformative synergies between the companies were also successfully explored.

In addition, Glycart's expansion in R&D expertise allowed the company to grow its employee base by a factor of six. Moreover, through Roche's support of Glycart's entrepreneurial endeavours, the company was able to develop into a designated centre of excellence (Umaña, 2020). Umaña (2020) states, "it has been a huge catalyst. Being part of Roche has allowed us to grow tremendously and to pursue new ideas." This growth was facilitated through Glycart's dual integration into pRED and the Large Molecule Research organisation, the establishment of global joint teams, the achievement of an optimum balance between collaboration and autonomy as well as the strategic alignment on exploiting the full value potential of the M&A (Umaña, 2020). The integration of Glycart also created new customer value in that the combined efforts that allow "to bring meaningful new potential treatment options for patients in need" (Umaña, 2020). Especially due to Roche's philosophy of diversity in R&D, the combined companies have increased their innovative capacity and therefore better chances to develop new research ideas which could result in differentiated novel treatments.

Conclusively, synergies and growth dynamics were effectively exploited. Moreover, any value destruction and impairment of organisational effectiveness was successfully avoided by integrating Glycart as separate R&D site, granting it autonomy in its R&D activities, preserving its biotech know-how and culture, and nurturing its entrepreneurial spirit. Moreover, by fostering a strategic alignment among the top management on Glycart's mission and the importance of preserving its innovativeness, the biotech start-up managed to maintain its independence and distinctiveness throughout several R&D reorganisations and discussions on a potential consolidation with Roche's Basel site (Umaña, 2020).

Finally, the integration of Glycart enabled Roche to achieve its short-term M&A motive (→ access innovations of Glycart) and long-term M&A motive (→ access innovative capacity of Glycart).

6.1.3 Case Assessment: Post-Merger Integration Success Factors

The analysis revealed that nearly all PMI SFs were present in the case of Glycart and Roche:

Integration Strategy		Integration Management		Value Creation	
Appropriate Depth of Integration (B)	✓	Leading Figures (A)	✓	Synergy Exploitation (A)	✓
Hybrid Integration Approach according to Value Chain Segmentation: R&D vs Non-R&D (C)	✓	Institutionalise Integration Office Responsibility (B)	✓	Implement Performance Transformation (B)	✓
› Discovery to PoC (R&D 1/2)	✓	Availability of Resources (A)	✓	Exploit the Momentum of Change (A)	✓
› PoC to Regulatory Approval (R&D 2/2)	⌣	Take Care of Talents (B)	✓	Exploit Growth Dynamics (B)	✓
› Manufacturing, Marketing/Sales (Non-R&D)	✓	Project Management (A)	✓	Achievement of Short-Term Motive: Innovations by Knowledge Transfer (C)	✓
› Support Functions (Non-R&D)	⌣	Introduce Integration Monitoring (B)	✓	Achievement of Long-Term Motive: Innovative Capaity by Know-How Preservation (C)	✓
Preservation Strategy in R&D: Biotech Autonomy & Know-How Protection (C)	✓				
Absorption Strategy in Non-R&D: Control of Pharma & Knowledge Transfer (C)	✓				

Theoretical Integration Success Frameworks:
(A) Five Factors that Make or Break an Integration Project (Bergamin & Braun, 2018)
(B) Performance Transformation Concept (Bergamin & Braun, 2018)
(C) Hybrid Integration Approach Framework (Schweizer, 2005b)

Legend:
✓ applied
⌣ partially applied
✗ not applied

Table 9: Consolidated PMI SFs Framework Assessment: GlycArt and Roche. Own Creation.

The two moderating aspects of the hybrid integration approach framework are that the later-stage R&D activities were fully controlled by Roche and that Glycart retained its localised support function management. However, these are only small deviations from the prototypical value chain segmentation proposed by Schweizer (2005b), which, by design, allows adaptations according to the context of the M&A and the know-how of the biotech company. In sum, the post-merger integration of Glycart into Roche can be considered exemplary and in line with the prescribed theory, which has certainly pathed the way to the successful outcome of the M&A.

In addition, other important best practices that have greatly contributed to the success of the post-merger integration could be identified through the case study. These factors have been touched upon in the theory, but are not fully accounted for by the theoretical PMI SFs which were reviewed. Firstly, Glycart and Roche have early on aligned and committed to a shared vision on genuine value exploration by the protection of diversity in research, which was maintained during and after the integration phase as well as demonstrated and reaffirmed on top management levels. Secondly, the integration of Glycart into Roche has achieved an optimum balance between autonomy and coordination as well as individualism and collectivism. This was facilitated by allowing Glycart to retain its independence and cultural distinctness, while also creating opportunities for collaboration and cultural amalgamation. Thirdly, Roche's openness towards new value propositions not only preserved Glycart's spirit, but actively encouraged and nurtured its entrepreneurialism, making the integration a catalyst for growth and new value creation. Finally, the case study also finds strong evidence for the need of early strategic preparation.

6.2 ESBATech AG and Alcon/Novartis

6.2.1 Contextual Analysis

6.2.1.1 Pre-Acquisition Context

ESBATech AG (henceforth "ESBATech"), a privately held Swiss biotech start-up, originated as a spin-off from the Institute of Molecular Biology of the University of Zurich in 1998 after its founders, Dominik Escher (CEO), Adrian Escher (CFO), and Alcide Barberis (CSO), had competed in the ETH/McKinsey business plan competition of the same year (Escher & Barberis, 2000). Until 2008, the Zurich-based company had received the Commission for Technology and Innovation (CTI) Start-Up Label, gone through several financing rounds (total capital raised: CHF 88.5 million), moved its location to Schlieren, and grown from six to approximately 50 employees (Barberis, 2018; Escher, 2011; NZZ, 2009).

ESBATech specialised in the field of "yeast-based functional genomics and drug discovery" from target identification to lead optimisation for various therapeutic applications (Escher & Barberis, 2000, p. 173). The company had developed several platform technologies for functional genomics and lead generation. ESBATech's approach of using its yeast-based technology platforms for screening potential target genes allowed a rapid and reliable identification and validation of stable and effective lead compounds (Escher & Barberis, 2000). Over time, ESBATech started to increasingly concentrate on the drug development of its highly stable and soluble fully human single-chain antibody fragments, which were selected using its proprietary single-chain antibody frameworks (Barberis, 2018; LUMITOS, n.d.). In 2002, ESBATech therefore decided to split its business operations into two units (antibody program and small molecule program) and, in 2006, to spin-off its small molecule unit into a separate company, Oncalis AG, led by Alcide Barberis. ESBATech henceforth focused on antibody drug development in the fields of ophthalmology, rheumatology, and respiratory diseases (Barberis, 2018, 2020; ESBATech, 2006). The company had several drug candidates in the preclinical and clinical pipeline, including its lead comounds ESBA105 (anti-TNF-alpha), ESBA1008 (anti-VEGF), and ESBA903 (anti-VEGF) (Escher, 2011; Morris, 2008).

ESBATech was completely focused on R&D. In 1999, it had entered into an early research collaboration with Roche for the validation of a potential target gene in Alzheimer's disease, which was completed in 2001. Thereafter, the company decided to concentrate its efforts on its own proprietary R&D portfolio and did not pursue any further collaborations. Thus, ESBATech did not generate any revenues at the point of acquisition and relied on its VC funding for financing its corporate and drug discovery activities (Escher, 2020).

6.2.1.2 Acquisition: Deal and Motive

The acquisition of ESBATech by Alcon, Inc. (henceforth "Alcon") for a price of USD 150 million in cash and an additional contingent payment of up to USD 439 million was announced on 13 September 2009 and completed shortly afterwards. The acquisition agreement included the rights to ESBATech's technology for application in ophthalmology, while non-ophthalmic rights were retained by ESBATech's shareholders and spun-off into a new company, Delenex Therapeutics AG, which was acquired by Cell Medica in 2016. Upon acquisition, Dominik Escher remained as head of ESBATech and substantially all of the company's employees joined Alcon (Alcon, 2009b; Barberis, 2018; Escher, 2011). At the time of ESBATech's acquisition, Alcon was owned by Nestlé SA with a 52% majority controlling-interest and Novartis AG (henceforth "Novartis") with a 25% minority stake (NZZ, 2009).

Dominik Escher (2020, Appendix 10.5.2) reveals that "the acquisition was driven by our financial need." In 2009, ESBATech was advancing three drug candidates through clinical development for which it required additional capital (Barberis, 2020; Escher, 2020). The biotech start-up had already been affected by an unfavourable investment climate during its prior financing rounds (2001 and 2006) due to the events of 9/11 and the tech bubble burst. Similarly, in 2009, the repercussions of the financial crisis compromised the company's original plan of an IPO and pushed it to screen the market for a potential buyer (Escher, 2020). Escher (2020) adds that "[w]e, on purpose, only wanted to do a trade sale with a franchise deal." While evoking the interest of multiple potential buyers, Alcon provided the best strategic fit for the company and the proposed transaction structure owing to its specialisation in ophthalmology and global leadership in the eye disease market (Barberis, 2020; Escher, 2020). Upon M&A announcement, Escher (as cited in Alcon, 2009b) stated, "[a]ll of us at ESBATech are excited to join with Alcon to advance this technology further and to develop products to treat serious eye diseases so that more patients can see better."

Alcon's then-CEO Kevin Buehler (as cited in Alcon, 2009b) stated, "[t]his acquisition is part of our ongoing strategy to enhance access to multiple sources of technologies and compounds that bolster our total research platform in support of innovative products to treat eye disease." The acquisition of ESBATech gave Alcon access to the company's technology platforms, its ophthalmic R&D pipeline as well as its expertise in biotechnology. In combination with Alcon's own expertise and capabilities in clinical development and commercialisation, the acquisition was anticipated to solidify Alcon's leadership in ophthalmology (Alcon, 2009b; Barberis, 2020; Escher, 2020). Buehler (as cited in Alcon, 2009b) further indicated that the ESBATech team "will become the foundation of Alcon's

biologics capability in the future." Escher (2020) confirms that Alcon "had no biologics […] and they had to move into that field because it was a huge growing field in eye diseases." Alcon's business segments at that time were Surgical, Pharmaceuticals, and Consumer (Alcon, 2009a). In this respect, Escher (2020) elaborates that "in the pharma sector, which, from a financial point of view, was the most important one for Alcon, they completely lacked innovation." Additionally, the M&A with ESBATech allowed Alcon to exploit the full potential of its collaboration with AstraZeneca on screening the latter's drug libraries (Alcon, 2009a).

On 15 December 2010, Novartis announced that it had agreed to a merger with Alcon, by which it would acquire the remaining 23% of Alcon's outstanding shares for USD 12.9 billion, having already acquired Nestlé's 77% majority stake in 2008/2010 for a cumulative amount of USD 38.7 billion. The acquisition of Alcon's full ownership was completed on 8 April 2011. Through this event, ESBATech transitioned from "ESBATech, an Alcon Biomedical Research Unit" to "ESBATech, a Novartis company" (Novartis, 2010b, 2012, 2013).

The acquisition of Alcon was in line with Novartis' strategy of diversification. Novartis' then-CEO Daniel Vasella (as cited in Novartis, 2010a) stated, "[t]he addition of Alcon will strategically strengthen our healthcare portfolio and our position in eye care, a sector with dynamic growth […]. It will also allow us to strengthen innovation power by combining R&D efforts and grow our global market presence thanks to our complementary product portfolios." Buehler (as cited in Novartis, 2010c, p. 1), who remained as the leader of the new Alcon division within Novartis, added that "[t]he combination of Alcon's deep understanding of the eye care specialty and the broad expertise and scale of Novartis will address virtually all key areas of eye care and position the Alcon business unit for faster growth." After the merger, Buehler (as cited in Thomson Financial & ASC, 2011) stated that both Alcon and Novartis see ESBATech as an opportunity to provide "a way to improve upon Lucentis clinical performance" as well as "to get between three and five fragments each year against targeted areas." Lucentis is an anti-VEGF antibody blockbusters drug for age-related macular degeneration (AMD) that Novartis in-licenses from Genentech (Thomson Financial & ASC, 2011). Hence, both short- and long-term M&A motives are given for Alcon as well as Novartis.

6.2.1.3 Post-Acquisition Context

Nowadays, ESBATech, a Novartis Company LLC, is part of the Novartis Institutes of BioMedical Research (NIBR). Novartis maintains two R&D units, NIBR (drug discovery) and Global Drug Development (clinical development/pipeline portfolio management). The

remaining cross-divisional organisational units of the company are Novartis Technical Operations (manufacturing) and Novartis Business Services (support functions). Besides NIBR, Novartis conducts research at the Novartis Institute for Tropical Diseases, the Friedrich Miescher Institute for Biomedical Research, and the Genomics Institute of Novartis Research Foundation (Novartis, n.d.-a, 2020).

Until 2015, NIBR consisted of several R&D sites located in Switzerland, the United States, Singapore, and China. In October 2016, however, Novartis decided for a new strategic plan in order to create a more unified and centralised research group within NIBR, establishing Basel (CH) and Cambridge (US) as consolidated centres of excellence. The decision for strategic redirection resulted from James Bradner's appointment as new president of NIBR. Today, the NIBR unit is staffed with approximately 6,000 employees and has five research locations, namely Basel, Cambridge, East Hanover (US), Emeryville (US), and Shanghai (China) (Novartis, n.d.-b, 2017; Swiss Broadcasting Corporation, 2016).

In early 2016, Dominik Escher resigned from his position as head of ESBATech in order to pursue new opportunities (Escher, 2020). Later that year, Novartis (2017, p. 58) announced as part of its reorganisation plan "to close ESBATech, a biologics group in Schlieren, Switzerland, subject to all appropriate consultation." The consolidation of ESBATech into Novartis' Basel research site included a layoff of 73 ESBATech employees as well as an increased turnover with employees deciding to pursue new opportunities outside of Novartis (Escher, 2020; Miller, 2016). According to Escher (2020), only two ESBATech employees have remained with Novartis to this date, while the operations of ESBATech, including its proprietary technology and drug candidate portfolio, are continued by NIBR in Basel. Moreover, on 28 February 2019, Novartis announced the spin-off of its Alcon division. As of 8 April 2019, Alcon became once again a public entity with focus on only two franchises, Surgical and Vision Care. Novartis, on the other hand, kept the ophthalmic pharmaceuticals portfolio as part of its Novartis Innovative Medicine Division, which included ESBATech's drug candidate pipeline (Alcon, 2019; Novartis, 2020).

ESBATech's lead candidate ESBA1008 (Brolucizumab, labelled RTH258 by Novartis) was successfully launched to the market (Escher, 2011; Novartis, 2020). After the remaining clinical trial under Alcon and Novartis, Brolucizumab was approved in 2019 by the FDA and in 2020 by the EMA for the treatment of wet AMD (EMA, 2020; FDA, 2019). The FDA granted Brolucizumab the approval on the first cycle of review as a novel drug without special designations (FDA, 2020). Brolucizumab is currently in clinical phase 3 for three additional

indications: diabetic macular edema, retinal vein occlusion, and diabetic retinopathy. Brolucizumab is sold as a prescription drug under the brand name Beovu (Novartis, 2019). Before its approval, Beovu was ranked among the ten most valuable R&D projects based on net present value and forecasted to achieve sales of USD 1.3 billion in 2024, therefore having blockbuster potential (EvaluatePharma, 2019). At the end of 2019, the product generated USD 35 million in sales , having been on the U.S. market for only four months (Novartis, 2020).

6.2.2 Post-Merger Integration Analysis

6.2.2.1 Integration Strategy

In 2009, Alcon pursued different strategies to boost its R&D capabilities, including external knowledge sourcing and targeted acquisitions. Alcon's R&D organisation was staffed with approximately 1,800 employees and centrally operated from Fort Worth, Texas. Alcon's approach to structuring its research activities followed the concept of centres of excellence with respective focus on the business segments of pharmaceuticals, surgical, and consumer products (Alcon, 2009a, 2009c). According to Escher (2020), Alcon's ophthalmic pharmaceutical research team consisted of 120 scientists based in Fort Worth.

Upon acquisition, ESBATech became a Biomedical Research Unit of Alcon and was fully embedded in the Alcon R&D organisation. As Alcon did not possess own biotechnology capabilities, ESBATech became the company's principal biologics site. The company continued to focus on its existing R&D portfolio and research activities, applying its single-chain antibody framework technology for the development of ophthalmic pharmaceuticals. ESBATech's core competency lay in the early-stage value chain steps. Hence, upon acquisition by Alcon, the company continued to manage the initial parts of the drug discovery process for its product candidates, from early research to clinical PoC. As ESBATech only had limited capabilities in clinical development, Alcon was responsible for the later-stage value chain steps, from clinical phase 2b to commercialisation. In regard to supporting functions, ESBATech adopted the systems and processes of Alcon (Barberis, 2020; Escher, 2020).

The organisational integration of ESBATech into Alcon was designed to support and safeguard the biotech's ongoing operations as well as to sustain its long-term innovative capacity. Consequently, ESBATech was granted a high level of operational autonomy and established as a self-contained Biomedical Research Unit. Escher's leadership was maintained, and all employees remained located in Schlieren, thereby protecting pre-established relationships and the modus operandi within the company. By keeping ESBATech at arms-length and providing it with great independence, the retention of the company's entrepreneurial

spirit and local biotech culture was ensured (Barberis, 2020; Escher, 2020). This was especially beneficial due to the dramatic cultural differences between Alcon's traditional pharma R&D organisation in Texas and the Swiss biotech start-up. Moreover, under Alcon, ESBATech grew its employee base to approximately 85 researchers (Escher, 2020). Consequently, the biotech know-how was preserved and potentially even expanded.

To leverage knowledge synergies, Alcon promoted cross-functional collaboration in its R&D organisation (Alcon, 2019). In the case of ESBATech, several mechanisms of knowledge transfer were applied. Escher joined the global R&D leadership team of Alcon and was in constant contact with the central research facility in Fort Worth. Moreover, to support ESBATech in its clinical trials, an Alcon employee was relocated to Schlieren for a two-year period. This person further served as a link to the clinical development teams at Alcon, whose resources and capabilities ESBATech was free to access (Escher, 2020). Consequently, knowledge transfer was enabled.

In 2011, ESBATech became a subsidiary of Novartis through the latter's merger with Alcon. Hence, ESBATech, as a legal entity, was integrated into Novartis Pharma Switzerland (Escher, 2020). The merger further included the embedding of Alcon's pharmaceutical R&D operations into NIBR. As a result, Alcon's ophthalmology disease research group as well as ESBATech were integrated into the ophthalmology division of NIBR, which comprised roughly 30 employees at that time (Escher, 2020; Novartis, 2013). According to Escher (2020), the strategy was to create "an organisation where all the different parts were continuing to do research and were equally distributed." Under Novartis, ESBATech continued to work on its own antibody programs using its proprietary technology. Moreover, ESBATech's value chain coverage perfectly matched the one of NIBR, which is responsible for the initial parts of the drug discovery process within Novartis, that is early research to clinical PoC. Therefore, ESBATech's focus on early R&D was maintained. The value chain activities of late-clinical development, manufacturing, and marketing and sales were taken over by Novartis. In regard to supporting functions (IT, HR, Finance), ESBATech fully adopted systems and processes of Novartis, but kept its local HR manager (Escher, 2020).

After the M&A with Novartis, ESBATech remained under Escher's leadership and was operated as a self-contained NIBR research location in Schlieren, thereby protecting pre-established relationships. With ESBATech becoming a Swiss subsidiary of Novartis, Escher further joined the executive management of Novartis Pharma Switzerland (Escher, 2020). Novartis' overall integration strategy, however, aimed for full control (Barberis, 2020). Escher

(2020) highlights that "Novartis had a culture to really completely integrate and make everything flat." Hence, ESBATech was granted only limited operational autonomy and could not keep its modus operandi and entrepreneurial spirit. This resulted in an increased turnover within ESBATech after the M&A (Barberis, 2020; Escher, 2020). Consequently, the biotech culture as well as specific know-how was not successfully preserved. Knowledge transfer, on the other hand, was enabled to some extent through the redeployment opportunities at Novartis, whereby some people of ESBATech temporarily joined other research groups within NIBR.

Conclusively, Alcon integrated ESBATech as an autonomous and self-contained R&D unit to preserve its biotech know-how and culture, while facilitating knowledge transfer opportunities for the advancement of ESBATech's drug candidate pipeline. Novartis, on the other hand, maintained ESBATech as a self-contained R&D unit, but pursued a degree of integration that hindered the preservation of the company's biotech know-how and culture in the long run. According to Escher (2020), ESBATech was well embedded within Novartis in 2016. The consolidation of ESBATech's operations into Novartis' R&D unit in Basel, however, did not resonate well with the employees and resulted in an unexpected turnover (Barberis, 2020; Escher, 2020). With only a handful of ESBATech employees transferring to Basel, the reorganisation caused a loss of ESBATech's biotech know-how and culture, the source of its innovativeness.

6.2.2.2 Integration Management

The integration planning with Alcon was initiated very early in the M&A process, with ESBATech making proactive proposals on how to integrate into Alcon already at the beginning of the negotiation phase. A concrete PMI business plan was then drafted during the due diligence and in place well before the signing of the M&A. Besides detailing the strategy for the integration, the business plan also plotted a steady future growth for ESBATech in conjunction with a sizable investment from Alcon for optimisations of ESBATech's R&D. Both Alcon and ESBATech had aligned early on a shared vision. In the case of Novartis, on the other hand, the integration planning with Alcon failed to account for ESBATech, and the Swiss biotech had to eventually drive the process once the takeover was completed (Escher, 2020). Escher (2020) states, "we felt as being in the vacuum." Hence, early strategic preparation is given in the case of Alcon, but not in the case of Novartis.

The integration of ESBATech into Alcon was managed in a very organised and committed manner, with a dedicated integration team in place and staffed by representatives of both parties (Escher, 2020). Leading figures from ESBATech and Alcon were involved early

on and continued to support the integration during the whole process. Escher (2020) emphasises that Alcon was very motivated to successfully integrate the company and that they "had the full attention from all the management levels." This is further exemplified by the early visit of the whole executive team of Alcon to ESBATech's facility in Schlieren in order to host a combined town hall. With Novartis, on the other hand, the integration management transpired in an improvised manner and was initiated and driven by ESBATech (Escher, 2020). Escher (2020) states, "we had to proactively approach Novartis hundreds of times probably to navigate our ways through the integration." Moreover, Escher (2020) explains that the issue was a lack of support and alignment in the top management level, as the decision for the M&A with Alcon was mainly driven by Daniel Vasella. Escher (2020) elaborates that, as a result, "it was pushed down into all the different divisions and functions, and people were not convinced about that acquisition." Moreover, Novartis' then-CEO Joseph Jimenez only visited ESBATech after two years once the company had delivered significant R&D successes, while there was no visit from the president of NIBR, Mark Fishman at that time. Eventually, the integration management also involved the heads of NIBR ophthalmology and Alcon (Escher, 2020). Escher's retention and proactive engagement in the management of both integration projects was pivotal and secured the support of a key promoter from the target company. Conclusively, for the integration management with Alcon, responsibilities were clearly assigned and institutionalised, and the project was supported by leading figures. With Novartis, in contrast, there was no clarity on integration responsibilities and the process was mainly steered by ESBATech.

Both resource management and integration monitoring were applied in the case of ESBATech's integration into Alcon. According to Escher (2020), ESBATech and Alcon were equally committed to successfully master the integration without disrupting the biotech's ongoing operations. The prepared business plan accounted for several stages of integration and progress was diligently monitored (Escher, 2020). In contrast, the integration of ESBATech into Novartis was neither prepared nor monitored. Escher (2020) points out that "Novartis has done a couple of acquisitions and I think they probably learned from how poorly the Alcon acquisition was done. […] But such integrations are always really difficult, except if you are extremely motivated, as Alcon was, then you spend time, money, and energy on that." In both cases, Escher as the head of ESBATech joined existing management constellations, and opportunities for personnel redeployment were created, thereby facilitating knowledge transfer (Escher, 2020). In sum, the integration with Alcon accounted for effective resource management and progress monitoring, whereas the one with Novartis underperformed in both areas.

6.2.2.3 Value Creation

The acquisition of ESBATech by Alcon and later by Novartis offered plenty of sources for value creation, which were partially exploited during the post-merger integration phase.

In both integration cases, the combination of the companies already provided synergistic effects purely on the basis of value chain management. By integrating ESBATech as an early research site, the company could continue to focus on its core competencies in R&D, while benefiting from Alcon's and Novartis' complementary and superior expertise in the value chain steps of late-clinical development, manufacturing, and marketing and sales. Moreover, ESBATech's R&D efforts were supported by an improved access to capital and resources within Alcon and Novartis (Escher, 2020). The addition of ESBATech's innovation prowess also raised Alcon's and Novartis' chances of finding new promising drug candidates for the R&D pipeline, which could potentially offset some of the productivity issues. According to Escher (2020), especially Alcon's R&D organisation had been unsuccessful at generating new innovative drugs for its pharmaceutical business segment. In regard to Alcon, Escher (2020) states that ESBATech had "a very privileged position in the leadership team. [...] [A]ll our programs were approved and went through the pipeline extremely smoothly." ESBATech also strengthened the R&D capabilities of Novartis. According to Escher (2020), ESBATech ha been "contributing 18% of all the biological proof of concepts […] of the complete Novartis pipeline since its inception." Given that ESBATech consisted of 90 employees at that time, in contrast to the 6,000 NIBR employees, this was quite a sizable achievement (Escher, 2020). Hence, the overall innovation power of Alcon's and Novartis' R&D was increased, and the combinational synergy potential of the M&A was partially exploited through an optimal division of work based on the respective value chain expertise of the companies.

Nevertheless, Escher (2020) reveals that the two integrations slowed down the advancement of Beovu by approximately two years. According to Escher (2020), if ESBATech had managed to go public, then Beovu would have been launched much earlier for a smaller indication and would most probably have succeeded in the market without the platform of a big pharma company. Escher (2020) explains that "it is probably a bit special in ophthalmology […] [b]ut if you can really position your product smartly and in a good indication and show that it is superior to everything out there, then it goes by its own." This moderates the findings on synergy exploitation.

There is also some evidence found for transformational synergy exploration. For Alcon, the addition of ESBATech enabled the company to enter the field of biotechnology (Barberis,

2020; Escher, 2020). Similarly, ESBATech's integration improved on Novartis' existing capabilities in biotechnology, evidenced by the contribution to Novartis' biologics pipeline (Escher, 2020). Hence, transformative synergies were mainly derived from the integration of ESBATech's unique biotech know-how, but were not fully exploited.

Under Alcon, ESBATech realised some of its business plan and grew its employee base by roughly 30 employees (Escher, 2020). Moreover, as part of the agreed business plan, Alcon made a significant investment into ESBATech to optimise and automate some parts of the research activities (Escher, 2020). This business plan, however, was not further pursued in this way under Novartis. Moreover, in 2016, an opportunity for growth and additional value creation was missed by Novartis. Escher (2020) reveals that he was contacted by Bradner before the announcement of the company's relocation and proposed to him "that ESBATech could be used as a unit which has special expertise for so-called difficult proteins or non-alternative protein formats. And he felt it is a very good idea, but obviously the board had already decided."

In sum, the integration of ESBATech into Novartis and the subsequent collaboration failed in realising the full value potential of the acquisition. In fact, it could even be seen as a destruction of ESBATech's pre-acquisition value (Barberis, 2020; Escher, 2020). Novartis' approach to the integration of ESBATech did not resonate well with the employees and changed the culture and modus operandi of the entrepreneurial biotech. Moreover, Novartis' behaviour towards ESBATech during the PMI phase might have contributed to the lack of cultural approximation and strategic alignment between the companies. As a result, employee turnover started to increase, especially after the closing of ESBATech's facility in Schlieren. Escher (2020) indicates that "[i]t was a complete destruction of all the know-how, which they were not anticipating at that range." This might also imply that Novartis did not fully comprehend the needs and values of ESBATech's employees. Escher (2020) concludes that "[i]f you make everything flat and integrate completely, as in the case of Novartis, I think that never goes well. You lose the spirit, the people, and the innovation." Barberis (2020, Appendix 10.5.3) confirms that "the specific know-how and the technology got lost or is at least not as active as it used to be." The main customer value derived from the M&A to this date seems to be Beovu, but whether Novartis manages to generate more innovation from ESBATech's technology in the future remains to be seen. Conclusively, the exploitation of growth dynamics was initiated during the integration into Alcon, but not continued by Novartis. The M&A motive achievement for Alcon was interrupted by the merger with Novartis. While the short-term motive of accessing ESBATech's innovations was realised by Novartis, the long-term motive of accessing ESBATech's innovative capacity was not achieved.

6.2.3 Case Assessment: Post-Merger Integration Success Factors

The analysis revealed that most PMI SFs were present in the case of ESBATech and Alcon, whilst only a few were found in the case of ESBATech and Novartis.

Integration Strategy	ALC	NOV	Integration Management	ALC	NOV	Value Creation	ALC	NOV
Appropriate Depth of Integration (B)	✓	✗	Leading Figures (A)	✓	∽	Synergy Exploitation (A)	∽	∽
Hybrid Integration Approach according to Value Chain Segmentation: R&D vs Non-R&D (C)	✓	✓	Institutionalise Integration Office Responsibility (B)	✓	✗	Implement Performance Transformation (B)	∽	∽
› Discovery to PoC (R&D 1/2)	✓	✓	Availability of Resources (A)	✓	✗	Exploit the Momentum of Change (A)	✓	✗
› PoC to Regulatory Approval (R&D 2/2)	∽	∽	Take Care of Talents (B)	✓	∽	Exploit Growth Dynamics (B)	✓	✗
› Manufacturing, Marketing/Sales (Non-R&D)	✓	✓	Project Management (A)	✓	✗	Achievement of Short-Term Motive: Innovations by Knowledge Transfer (C)	∽	✓
› Support Functions (Non-R&D)	✓	✓	Introduce Integration Monitoring (B)	✓	✗	Achievement of Long-Term Motive: Innovative Capacity by Know-How Preservation (C)	∽	✗
Preservation Strategy in R&D: Biotech Autonomy & Know-How Protection (C)	✓	✗						
Absorption Strategy in Non-R&D: Control of Pharma & Knowledge Transfer (C)	✓	✓						

Theoretical Integration Success Frameworks:
(A) Five Factors that Make or Break an Integration Project (Bergamin & Braun, 2018)
(B) Performance Transformation Concept (Bergamin & Braun, 2018)
(C) Hybrid Integration Approach Framework (Schweizer, 2005b)

Legend:
✓ applied
∽ partially applied
✗ not applied

Table 10: Consolidated PMI SFs Framework Assessment: ESBATech and Alcon/Novartis. Own Creation.

Similar to the case study of Glycart and Roche, the realisation of the hybrid integration approach is slightly moderated through the absorption of ESBATech's later-stage R&D activities, but otherwise given. While Alcon implemented the preservation strategy for R&D, Novartis aimed for full control without consideration for the biotech know-how of ESBATech. Moreover, while ESBATech's integration into Alcon was successful and in line with the SFs for integration management, the subsequent integration into Novartis did hardly comply with the PMI SFs in this dimension and only partially fulfilled the SFs on leading figures and taking care of talents. Finally, both PMI cases moderately applied the PMI SFs for value creation, especially concerning proper synergy exploitation and full capitalisation on the specific biotech know-how of ESBATech. In sum, the integration of ESBATech into Alcon was successful and mostly in line with the prescribed theory, while the integration of ESBATech into Novartis was unsuccessful, which certainly can be attributed to the missed application of the PMI SFs.

Several additional factors can be identified which have led to integration success or failure, namely a (lack of) strategic alignment and commitment to exploiting the full value potential of the M&A and maintaining diversity in research as well as a (lack of) early strategic preparation. Moreover, the faulty PMI by Novartis can be associated with overlooking the dissonance of ESBATech with the limitation of its independence, autonomy, and individualism, neglecting to create a sense of "togetherness" for bridging cultural differences, and neglecting the entrepreneurial spirit of ESBATech and its employees. Interestingly, both Escher (2020) and Barberis (2020) have referenced Roche and Glycart as a PMI success story.

6.3 Actelion Ltd. and Johnson & Johnson

6.3.1 Contextual Analysis

6.3.1.1 Pre-Acquisition Context

Actelion Ltd. (henceforth "Actelion"), a publicly held Swiss biotech company, originated as a spin-off from Roche in 1997 after its founders, Jean-Paul Clozel (CEO), Martine Clozel (CSO), Walter Fischli, and Thomas Widmann, decided to leave their former employer in order to continue the drug development of endothelin receptor antagonists (ERA), targeted at the treatment of pulmonary arterial hypertension (PAH). ERA was first discovered by Martine Clozel in the mid-1980s. Andre J. Muller joined the team as a fifth founding member. Until 1998, the Swiss biotech start-up had completed a financing round, which included a syndicate of venture capitalists, and established its location in Allschwil, Basel. As the previous R&D work was done under Roche, Actelion had to initially in-license its drug compounds. In 2000, the company decided to undertake an IPO at the Swiss Stock Exchange and was valued at CHF 1.2 billion. A year later, the company's first product, Tracleer, was launched to the market (Cohen, n.d.). By 2017, Actelion had become a mature biopharmaceutical holding company with CHF 2.412 billion in annual sales, making it Europe's largest biotech. As of February 2017, the company had a market capitalisation of CHF 27.6 billion. Remaining headquartered in Allschwil, under its principal subsidiary Actelion Pharmaceuticals Ltd., the company further operated internationally through 30 affiliates (Actelion, 2017c; Alantra, 2017).

Actelion specialised in the field of orphan and speciality drugs for the treatment of rare diseases. Its drug discovery mainly focused on new chemical entities, G-protein coupled receptors (GPCRs), aspartic proteinases and other enzymes, anti-invectives, and ion channels. Actelion had become a worldwide leader in the treatment of PAH. The company had a comprehensive PAH franchise tending to all stages of the disease, with particular focus on the treatment pathways of Endothelin and Prostacyclin. Actelion's PAH portfolio included Tracleer, Opsumit, Uptravi, Veletri, and Ventavis. Actelion also had a small speciality portfolio consisting of Valchlor and Zavesca. The company's products were sold worldwide in more than 50 markets. As of 2017, the company had ten new drug compounds in the pipeline for PAH and other therapeutic areas as well as several programs on supplementary indications for Opsumit and Uptravi (Actelion, 2017a; Alantra, 2017).

Actelion was a fully integrated company with a total of 2,644 employees covering all important value chain steps and supporting functions, namely drug discovery (388 employees), clinical development (452 employees), marketing and sales (1,443 employees), and corporate

functions (341 employees). The company structured its business operations into a drug discovery organisation, a development organisation, and a speciality commercial organisation. The majority of its R&D activities were carried out internally in a centralised research centre in Allschwil. For global distribution, marketing, and sales activities, Actelion relied on its 30 subsidiaries as well as partner networks for additional market reach. For manufacturing, Actelion acted as a virtual biotech in that it outsourced the process to third-party providers, namely contract manufacturing organisations (CMOs). Moreover, the company engaged in licensing, targeted acquisitions, and strategic partnerships in order to leverage external expertise and innovation (Actelion, 2017a, 2017b). According to Actelion (2017a, p. 9), it had "become a new kind of biopharmaceutical company: one that blends biotech's innovation, speed and flexibility with big pharma's operating discipline and excellence in execution."

6.3.1.2 Acquisition: Deal and Motive

The acquisition of Actelion by an indirect subsidiary of Johnson & Johnson (henceforth "J&J"), namely Janssen Holding GmbH (henceforth "Janssen"), for a price of USD 30 billion in cash was announced on 26 January 2017. The purchase price represented a 23% premium (Johnson & Johnson & Actelion, n.d.). The deal was the result of exclusive negotiations between the parties, which officially commenced in November 2016 (Quest-France, 2016).

The acquisition agreement included a demerger of Actelion's R&D organisation and pipeline into a new subsidiary, R&D NewCo, which was to be spun-off before the closing of the M&A. Accordingly, J&J would only acquire Actelion's commercial organisation and related functions, the marketed products, the programs for supplementary indications and derivatives of in-market compounds, and two speciality clinical-stage drug candidates (Cadozolid & Ponesimod). R&D NewCo was incorporated as Idorsia Ltd. (henceforth "Idorsia") on 2 March 2017. Prior to the completion of the M&A, Idorsia shares were distributed to existing Actelion shareholders. The acquisition agreement further included revenue sharing and IP-cross-licensing agreements between Idorsia and Actelion as well as collaboration and service agreements between Idorsia and J&J. On 16 June 2017, J&J completed the majority shareholding acquisition of Actelion through a public tender offer. Concurrently, Idorsia was spun-off from Actelion and listed on the Swiss Stock Exchange. Idorsia was staffed with over 600 employees, had nine drug candidates in the pipeline, and maintained its research facilities in co-location with Actelion's headquarter operations in Allschwil. The company further had CHF 1 billion in cash, whereof CHF 580 million were provided through a convertible loan from Cilag Holding AG, a subsidiary of J&J. By a partial conversion of the loan, J&J received a 9.9% minority stake in Idorsia (Actelion, 2017e; Alantra,

2017; Idorsia, 2020a; Johnson & Johnson & Actelion, n.d.). The M&A was followed by a squeeze-out of Actelion's minority shareholders on 25 October 2017 and a delisting of the company's shares on 7 November 2016 (Actelion, n.d.-c). Upon closing, Actelion's former board and top management left the company and were replaced by a new board with Ludo Ooms as Chairman and Jane Griffiths as Global Head of Actelion (Actelion, 2017d, 2017f).

Actelion had been the subject of unsolicited offers several times over the course of its history, but consistently rejected the bidders (Quest-France, 2016). Actelion's CEO Jean-Paul Clozel (2016) stated, "I am convinced that we would be less innovative if we were integrated within another company." However, he also revealed that "[i]t is very difficult to continually innovate in the field of PAH at the same pace – hence our shift towards other therapeutic areas" (Clozel, 2016). In the end, it was the unique deal structure that convinced Actelion's shareholders and management, especially Clozel, due to the "mutually-beneficial nature" (Clozel, 2017). Clozel (2017) added that "[t]here was no value destruction. It is true that I have always claimed I would never sell, but in fine, we didn't sell the company, we were bought. J&J made a fair offer that Actelion could not refuse." Through the deal structure, Clozel could maintain Actelion's innovation engine and set out to write another start-up success story with Idorsia. Jean-Pierre Garnier (as cited in Johnson & Johnson & Actelion, 2017), Chairman of Actelion, confirmed that the deal offered unique value in that "shareholders can monetize their holdings in Actelion at a highly attractive cash price […], while at the same time retaining a significant stake in the future potential upside of Actelion's earlier stage pipeline."

J&J CEO Alex Gorsky (as cited in Johnson & Johnson & Actelion, 2017) stated, "[a]dding Actelion's portfolio to our already strong Janssen Pharmaceuticals business is a unique opportunity for us to expand our portfolio with leading, differentiated in-market medicines and promising late-stage products. We expect to leverage our established global presence and commercial strength to accelerate growth and patient access to these important therapies." Facing productivity challenges and patent expirations, J&J was eager to settle a deal which could provide sufficient revenue growth for its pharmaceutical arm (Crow & Atkins, 2017). J&J's Pharma Chairman Joacquin Duato (2017) stated, "Actelion will become a new growth engine for Johnson & Johnson, immediately improving our sales growth, operating margins and earnings per share (EPS)." The M&A also supported J&J's strategy of diversification. Through the M&A with Actelion, PAH directly became the sixth therapeutic area of Janssen, with an existing lucrative product portfolio and an established market presence through the specialised commercial organisation (Johnson & Johnson, 2017a). According to the press release, the deal structure would "provide Johnson & Johnson flexibility to accelerate

investment in its industry-leading, innovative pipeline to drive additional growth" (Johnson & Johnson & Actelion, 2017). Moreover, J&J secured potential financial returns on its shareholding in Idorsia and access to certain pipeline programs (Johnson & Johnson & Actelion, 2017). Thus, the short-term motive is given, and the long-term motive might also be present.

6.3.1.3 Post-Acquisition Context

Nowadays, Actelion Ltd., a Janssen Pharmaceutical Company of Johnson & Johnson, is part of J&J's Pharmaceuticals division. This division is made up of the Janssen family of companies and has six therapeutic areas: cardiovascular and metabolism, immunology, infectious diseases and vaccines, neurosciences, oncology, and pulmonary hypertension (PH) (Johnson & Johnson, 2017b, 2020a). Within Janssen, Actelion is mainly responsible for the PH portfolio with its existing PAH franchise. The speciality product Zavesca is still managed by Actelion but belongs to the cardiovascular & metabolism portfolio of Janssen. The speciality product Valchlor has become part of the oncology portfolio of Janssen but is no longer managed by Actelion as the worldwide marketing rights for the product were sold to another company in 2018 (Actelion, n.d.-b; Janssen, n.d.-a; Verdict Media, 2018). In 2019, the PH portfolio of J&J achieved USD 2.673 billion in sales, thereby contributing 6.22% to the company's total pharmaceutical business sales (Johnson & Johnson, 2020a; Johnson & Johnson & Actelion, n.d.). Janssen's late-stage clinical pipeline for PH consists of Actelion's former programs on supplementary indications for Opsumit and Uptravi. Of the acquired late-stage speciality drug candidates, Ponesimod is in the neuroscience pipeline and currently in registration, while the Cadazolid program was stopped (Johnson & Johnson, 2020b; N. P. Taylor, 2018).

Actelion's headquarters remain in Allschwil, under its principal subsidiary Actelion Pharmaceuticals Ltd. Actelion has also become part of the Switzerland division of Janssen (Actelion, 2017c; Johnson & Johnson, 2017b). Both Ludo Ooms and Jane Griffiths have retired from their roles at Actelion, while Nicholas Franco was named Site Head of Allschwil in August 2019 (C. Roth Grünenfelder, personal communication, 23 March 2020). As no successors for Ooms and Griffiths could be identified in the research, the leadership functions were presumably of temporary nature and absorbed by Janssen after the integration. While Actelion reportedly continues to operate internationally through its subsidiaries (Actelion, n.d.-a), J&J only lists a total of 15 subsidiaries carrying Actelion in the name, which implies that some of the affiliates were integrated into other Janssen companies (Johnson & Johnson, 2019). Finally, Actelion's next-door neighbour, Idorsia, continues to be led by Clozel as CEO and Garnier as Chairman. Nowadays, Idorsia is a publicly held clinical-stage biopharmaceutical start-up with a market capitalisation of CHF 3.9 billion. Moreover, the company has expanded to more than

800 employees and is currently advancing a pipeline of nine former Actelion drug candidates and three new additions (Idorsia, 2020a, 2020b).

6.3.2 Post-Merger Integration Analysis

6.3.2.1 Integration Strategy

For J&J, M&A is an important source of corporate growth as well as a means for realising its strategy of diversification. Albeit tending towards smaller acquisitions, J&J also explores opportunities for value creation with established companies, such as Actelion (Duato, 2017; Gorsky, 2017). J&J integrated Actelion as a subsidiary into the Janssen family of companies and added PH as a sixth core therapeutic area to its Pharmaceuticals division (Johnson & Johnson, 2017b). Moreover, J&J's decentralised organisational structure aims for innovation and customer focus by promoting autonomy and responsibility among its subsidiaries. This philosophy also finds reflection in the company's post-merger integration strategy for Actelion (Gorsky, 2017). Griffiths (2018) stated, "[a]lthough J&J has acquired Actelion, we want to retain our distinctness, while integrating Actelion to be part of Janssen and J&J."

Actelion's home base in Allschwil was maintained and "designated as the headquarters for research, sales and business development" for the PH therapeutic area, thereby centralising strategic and administrative operations (Ooms, 2019). Preserving the location also allowed J&J to establish a presence in the biotech and big pharma hub Basel (Griffiths, 2018; Ooms, 2019). According to Griffiths (2018), the customer-facing groups of Actelion were largely retained as they were, while minimal reporting line changes to Janssen subsidiaries occurred for Actelion affiliates in small- to mid-size markets. Having entered the field of PH through the M&A, J&J reportedly had no overlaps with the commercial organisation of Actelion (Griffiths, 2018; Ooms, 2019). Griffiths (2018) stated that the goal was to "combine the scientific and customer intimacy skills of Actelion with some of the great strengths that J&J has in certain areas, for example in market access, health economics, pricing, and big data analytics." Moreover, the absorption of Actelion and its subsidiaries into the decentralised Janssen structure aimed at preserving the patient-focus and pioneering spirit of the company. Griffiths (2019) highlighted that J&J "acquired Actelion precisely because of that passion around patients. […] The rationale behind such a structure is precisely to retain that creativity and drive by concentrating team energies around a single effort." Nicholas Franco " (2020, Appendix 10.5.4) further reveals that "[o]ne of the main benefits related to the acquisition, i.e. expansion of the commercial availability of Actelion products via the Janssen global footprint, was initiated quickly after the closing." Hence, Actelion and Janssen likely share the marketing and sales value chain task.

Franco (2020) states that "[a]ll parts of Actelion's value chain were taken over by J&J, except maybe the manufacturing of our products." As Actelion spun off its R&D unit prior to the M&A, the task was absorbed by the Janssen R&D organisation, which operates globally through a network of R&D locations and dedicated therapeutic area teams. For Actelion's R&D, the teams for Pulmonary Hypertension and Cardiovascular & Metabolism are mainly responsible (Janssen, n.d.-c, n.d.-b). In regard to manufacturing, J&J maintained Actelion's network of CMOs, while integrating Actelion's network management function into the J&J Supply Chain organisation as well as aligning it to the J&J policies and processes. All of Actelion's support functions were fully integrated into J&J's established functional organisations (Franco, 2020). Furthermore, J&J minimised the duplication of support functions by cutting 75 positions within Actelion upon acquisition (Ooms, 2019). Franco (2020) indicates that "[a]n enabler of any integration is how quickly the transactional systems/processes and indeed the legal entities can be merged. […] The Actelion integration actually managed to accomplish the merging of key systems and processes."

Franco (2020) highlights that "[t]he Actelion strategy of being the leader in cardiopulmonary diseases, mainly pulmonary hypertension, remains unchanged until today. The ways of operating and the organizational structure aligned itself to the J&J ways." While Actelion employees had to adapt to J&J's organisational structure and corporate culture, the transition process was well supported and also offered various benefits. Firstly, Actelion was diversifying into other therapeutic areas prior to the M&A, and through the integration into J&J, employees could continue to focus on their pioneering work in PAH. Secondly, J&J's size and culture of openness provided significant opportunities for personal development. During the integration process, J&J actively encouraged employee engagement among the Actelion staff and facilitated personnel redeployment in both directions of the companies, thereby enabling cultural approximation, knowledge sharing, and know-how spillover. As both J&J and Actelion were very patient-focused and science-driven with innovation for transformational medicine as their mission, the cultural amalgamation was simplified and built upon these core values (Franco, 2020; Griffiths, 2018, 2019; Ooms, 2019).

Due to the deal structure, Actelion's R&D unit was not part of the integration. Hence, the integration strategy did not have to account for biotech know-how preservation. However, it can be argued that through the complete spin-off of Idorsia, the requirements of the hybrid integration approach framework were fulfilled in that a potential loss of biotech know-how and culture was completely mitigated. Moreover, as Actelion's commercial organisation was a key driver for the M&A, one could further argue that the customer and product know-how of

Actelion was preserved by maintaining its spirit and customer-intimacy model, which was partially facilitated by granting it some degree of individualism and autonomy.

6.3.2.2 Integration Management

The integration planning commenced early in the M&A process and a comprehensive two-year integration plan was in place before the closing of the acquisition (Franco, 2020; HZ, 2019). Moreover, J&J stated that it capitalised on previous M&A experience by applying lessons learned to the integration of Actelion, J&J's largest acquisitions to date (Gorsky, 2017). In terms of strategic vision, Griffiths (2018) stated, "[we have] approached the integration by looking at how we can use the size, scale, and the expertise within Janssen to help Actelion grow faster." The preparation phase further aimed at mastering the complexity of the situation given by the simultaneous Idorsia demerger and Actelion integration planning, while mitigating the risks of business disruption and uncertainty (Griffiths, 2018, 2019). Moreover, an integration team was formed and key employees from both Actelion and J&J were involved early in the integration planning (Franco, 2020). Hence, early strategic preparation for the integration phase was given.

For the integration management, a dedicated cross-functional global integration team consisting of both J&J and Deloitte employees was activated upon the closing of the M&A. The J&J employees were temporarily assigned to the integration project and responsible for the integration leadership and execution, while Deloitte manpower joined the integration taskforce for logistical support. Finally, the integration team readily identified and involved Actelion employees to ensure access to key information and aid in the transition to the J&J systems (Franco, 2020). The integration management clearly institutionalised integration responsibilities and involved several key promoters. On the part of J&J, Ooms took on the role of Global Integration Leader, Jane Shaw was tasked with the Global Integration Management Office Lead, and Griffiths was appointed Global Head of Actelion during the integration phase, and acted as a key enabler for the integration (Emmerth, 2017; Fulford, 2018; Griffiths, 2018; Ooms, 2019). The integration team also engaged several target company representatives. Franco, who was already majorly involved in the preceding M&A process, was consulted on key information about the company and the transaction (Franco, 2020). Moreover, Otto Schwarz, former Actelion COO, was retained as a senior advisor for Griffiths with the mission to support the integration and business continuity during the first year of integration (Actelion, 2017d). Conclusively, representatives as well as leading figures from both companies were actively involved in the integration management. By the end of 2019, when most of the integration was completed, both Griffiths and Ooms retired from their roles at Actelion, and only a small integration team remained to finish the project (Ooms, 2019).

In regard to resource management, Franco (2020) reveals that "[a]n element of the success of the integration was the oversight at the highest levels of the J&J organization, providing quick decision-making, adaptation of the plans based on the actual situation and additional resources when necessary." In line with this statement, the mission of the integration management was to foster employee commitment and operational effectiveness (Griffiths, 2018, 2019; Ooms, 2019). By fashioning professional development opportunities for Actelion employees in the new organisation, J&J provided the right conditions for employee engagement and cultural amalgamation. Franco, for instance, was made Allschwil Site Head towards the end of the integration project (Franco, 2020). According to Ooms (2019), J&J also tried to provide redeployment opportunities for Actelion employees which were affected by the job cuts. In terms of employee motivation, Griffiths (2019) pointed out that "we knew that successful integration would partly hinge on our ability to win over the hearts and minds of the Actelion staff." Similarly, through the deployment of Griffiths and Ooms into Actelion's leadership and the redeployment of other J&J key employees into Actelion, it was also made use of J&J's talents to support the integration process. The sourcing of additional Deloitte manpower by J&J was another effective measure to guarantee resource availability. Franco (2020) confirms that "extremely well-supported and staffed processes were put in place to ease the organization into the new processes/systems."

Moreover, Franco's (2020) statement on the project oversight also illustrates that J&J employed effective integration monitoring mechanisms. As mentioned, a well-designed plan was set in place before the closing of the acquisition, and progress was diligently monitored by the integration team. This is also exemplified by the ready responses on the integration progress given by Griffiths (2018, 2019) and Ooms (2019) in past interviews. Moreover, an integration survey was used to assess the effectiveness and resonance of the integration efforts among Actelion employees, providing a method for a swift detection of potential issues (Griffiths, 2018). Griffiths (2018) elaborated that "[i]f they want certain improvements, we try to act on those." Finally, the integration management followed the strategy of good communication to ensure transparency and minimise uncertainty among Actelion employees (Griffiths, 2018).

6.3.2.3 Value Creation

Besides providing diversification and growth for J&J, the acquisition of Actelion also offered plenty of sources for value creation, which have already been exploited during the post-merger integration phase and will continue to be fully realised. Ooms (2019) confirmed that "[s]uch an investment is not recouped financially after two years, it takes longer. […] Innovations for

patients in this therapeutic area require a long-term perspective." Hence, some value creation is still expected to manifest in the future.

The combination of the two companies has provided significant synergistic effects on the basis of marketing and sales as well as life cycle management. Building upon Actelion's specialised know-how, established reputation, and resonance with customers, J&J's global footprint as well as superior skills in reimbursement and market access significantly expands the availability and accessibility of Actelion's PAH medicines (Franco, 2020; Gorsky, 2017; Griffiths, 2018, 2019). This not only brings value for customers, but also provides significant revenue growth for J&J through an improved market penetration. Additionally, J&J's geographic market coverage eliminated Actelion's need to rely on network partners for certain countries, which increased profit margins on product sales (Griffiths, 2019). In terms of R&D, J&J's superior infrastructure, resource bases, and clinical development capabilities facilitate a rapid advancement and successful market launch of Actelion's late-stage drug candidates, particularly for the programs on supplementary indications (Franco, 2020; Gorsky, 2017; Griffiths, 2019; Ooms, 2019). As a result, the combined companies can better realise additional therapeutic application opportunities for Actelion's PAH franchise, which not only expands treatment options for patients, but also enables more revenue generation in the market exclusivity phase of a compound's life cycle. In addition, the profit from Actelion's PAH franchise helps in alleviating some of J&J's productivity challenges and patient cliffs, while allowing J&J to increase investments into its R&D organisation for new drug discovery in PH (BSIC, 2017; Crow & Atkins, 2017; Franco, 2020; Johnson & Johnson & Actelion, 2017; Ooms, 2019). Moreover, albeit not being a key value driver for the M&A, the combination of the two companies enabled cost savings, especially in supporting functions and infrastructures, which could be realised through the elimination of duplications (Franco, 2020; Griffiths, 2018).

The integration of Actelion also enabled J&J to add the field of PH as a new therapeutic area to its Pharmaceuticals division, thereby expanding the company's healthcare portfolio and R&D focus, which already implies some transformation. Moreover, the integration also allowed the exploration of transformative synergies. According to Franco (2020), "[t]he Actelion organization has implemented the many beneficial processes of J&J, while J&J has gained a deeper appreciation of the customer-intimacy model at Actelion, while implementing all the compliance programs in place." Hence, both J&J and Actelion capitalised on the combined strengths and know-how by creating additional value through the optimisation of not only systems and processes, but also business practices (Griffiths, 2019; Ooms, 2019).

Moreover, the integration enabled the exploitation of growth dynamics. The integration of Actelion as well as the addition of PH as a major therapeutic area of Janssen enables J&J on its newfound quest to turn PAH into a more manageable condition and to develop superior solutions for a disease area of significant unmet medical need (Griffiths, 2018, 2019; Ooms, 2019). Gorsky (2017) stated, "[w]e have also set ourselves the target of one day curing patients with PAH […] We intend to make PAH one of our core disciplines over the next 10 years." J&J aims at leveraging its R&D capabilities and external partnerships in order to create new innovation in PH and develop the next generation of drugs for expanding Actelion's PAH franchise (Duato, 2017; Ooms, 2019). Moreover, besides improving product accessibility, J&J also makes concentrated efforts into raising awareness for the condition as well as providing information and advice to facilitate better care (Griffiths, 2019). Griffiths (2019) stated that Actelion and J&J also aim at "complimenting […] treatments with companion diagnostics to enable early detection." With the support of J&J and in line the patient-centricity strategy, Actelion has therefore increased its efforts into developing improved diagnostic options for the field of PH. So far, these efforts have resulted in the creation of a diagnostic app as well as a research collaboration between Actelion and Analytics 4Life on potential digital technologies for improved PH detection. Actelion and J&J also investigate new value opportunities derived from artificial intelligence, big data, and biomarkers, which could improve R&D, diagnostics, and patient care in the field of PH (Franco, 2020; Griffiths, 2019; Ooms, 2019). Consequently, the integration also gave way to a newfound momentum for investments into the transformational science of PH.

Finally, any value destruction was successfully avoided through the spin-off of Idorsia, which could thereby preserve its biotech know-how and culture. This also shows that even in mature biotech start-ups like Actelion, which was Europe's largest biotech before the acquisition, the spirit and modus operandi of the company are seen as a major source of innovativeness. Moreover, it also highlights that R&D is the critical element of concern for entrepreneurial biotech founders when evaluating the potential consequences of an M&A with big pharma. The unique deal structure that Actelion and J&J agreed upon is exemplary in that it serves the needs of both companies: allowing the mature and fully integrated biotech to renew itself and refocus on its innovation engine, while providing big pharma access to the company's innovative product portfolio and late-stage pipeline. Lastly, the maintenance of Actelion's customer-intimacy model also reveals opportunities for value preservation outside of R&D.

6.3.3 Case Assessment: Post-Merger Integration Success Factors

The analysis revealed that nearly all PMI SFs were present in the case of Actelion and J&J:

Integration Strategy		Integration Management		Value Creation	
Appropriate Depth of Integration (B)	✓	Leading Figures (A)	✓	Synergy Exploitation (A)	✓
Hybrid Integration Approach according to Value Chain Segmentation: R&D vs Non-R&D (C)	✓	Institutionalise Integration Office Responsibility (B)	✓	Implement Performance Transformation (B)	✓
› R&D	✓	Availability of Resources (A)	✓	Exploit the Momentum of Change (A)	✓
› Manufacturing, Marketing/Sales (non-R&D)	⌣	Take Care of Talents (B)	✓	Exploit Growth Dynamics (B)	✓
› Support Functions (non-R&D)	✓	Project Management (A)	✓	Achievement of Short-Term Motive: Innovations by Knowledge Transfer (C)	✓
Preservation Strategy in R&D: Biotech Autonomy & Know-How Protection (C)	✓	Introduce Integration Monitoring (B)	✓	Achievement of Long-Term Motive: Innovative Capacity by Know-How Preservation (C)	⌣
Absorption Strategy in Non-R&D: Control of Pharma & Knowledge Transfer (C)	⌣				

Theoretical Integration Success Frameworks:
(A) Five Factors that Make or Break an Integration Project (Bergamin & Braun, 2018)
(B) Performance Transformation Concept (Bergamin & Braun, 2018)
(C) Hybrid Integration Approach Framework (Schweizer, 2005b)

Legend:
✓ applied
⌣ partially applied
✗ not applied

Table 11: Consolidated PMI SFs Framework Assessment: Actelion and Johnson & Johnson. Own Creation.

The two moderating aspects of the hybrid framework are the retention of the CMO network and the marketing/sales task-sharing between Actelion and J&J as well as the preservation strategy applied to Actelion's headquarter operations and customer-facing groups. However, as the hybrid framework proposed by Schweizer is generally directed towards "M&A as R&D" integration scenarios, small deviations from theory are expected. Moreover, the deal structure shows that the preservation of biotech know-how is equally important for mature and fully integrated biotechs, such as Actelion, as it is for young R&D-focused biotechs. Likewise, the preservation of the customer-intimacy model also highlights that the value proposition of Actelion goes beyond its R&D-specific biotech know-how. Hence, if allowing for the consideration of the deal structure and non-R&D-specific know-how, the hybrid framework has found full application. The moderating aspect of the long-term motive achievement is that while still creating opportunities for growth and future innovation, the M&A did not give J&J complete and direct access to Actelion's innovative capacity. In sum, the deal structure and post-merger integration of Actelion into J&J can be considered exemplary and in line with the theoretical PMI SFs, which has pathed the way to the successful outcome of this M&A.

In addition, other best practices have greatly contributed to the success of the post-merger integration, namely an alignment and commitment to a shared vision on exploiting the true value potential of the M&A even if it includes a spin-off, an early strategic preparation, the balance between autonomy and coordination as well as individualism and cultural amalgamation, and the maintenance of the pioneering spirit and entrepreneurial drive of the biotech. Hence, these best practices can be identified as additional PMI SFs.

7 Discussion of Findings

This chapter provides a discussion of the findings in order to examine the defined hypotheses, assess the applicability of the reviewed integration success frameworks, highlight the gap between theory and practice, and introduce the newly identified scope-specific PMI SFs.

7.1 Pharma & Biotech M&A: Evidence for Trends & Motives

Mergers and acquisitions have become an essential means for big pharma to achieve corporate renewal and growth, especially in times of industry challenges and shifting industry trends. Biotechs offer unique value propositions in form of sophisticated novel drug compounds and efficient technology platforms, but also in terms of innovative capabilities derived from their know-how, entrepreneurial spirit, and agile modus operandi. Consequently, biotech companies have become a preferred M&A target for big pharma. For biotechs, especially early-growth start-ups, the road to maturity and profitability is long and full of hurdles, rendering them open to potential strategic partnerships, including M&As.

The trend analysis on M&As with big pharma as buyer and Swiss biotech as target showed that out of eleven transactions which occurred between 2005 and 2019, seven could be classified as "Originator acquires Innovator", three as "OTC/Consumer Health acquires Innovator", and one as "OTC/Consumer Health acquires Manufacturing & Sales Expert." However, two out of the three "OTC/Consumer Health acquires Innovator" can be associated with a big pharma company that is transitioning towards the Originator archetype. The strategic purpose of the M&As in the "Originator acquires Innovator" category was to strengthen R&D in the big pharma companies' core business segment (e.g. pharmaceuticals) and core therapeutic area (e.g. oncology). Originators generally targeted R&D-focused privately held pre-/clinical-stage biotech start-ups. The case study analysis revealed that big pharma companies, especially Originators, which acquire biotech start-ups, undertake the M&A to access the biotech's current innovations as well as its capacity for generating more innovations in the future.

Conclusively, the findings of the analyses show that the hypotheses, which were based on the propositions of Kurmann Partners (2017) and Schweizer (2005b), are true:

- H1: There is a high tendency for "Originators" to acquire "Innovators."
- H2: When acquiring biotechs, the short-term motive of big pharma tends to be the improvement of market positions by accessing the biotech's innovations.
- H3: When acquiring biotechs, the long-term motive of big pharma tends to be the support of the overall growth strategy by accessing the biotech's innovative capacity.

7.2 Applicability of the Theoretical Integration Success Frameworks

Post-merger integration is decisive for the overall success of the M&A in that it encompasses all activities which serve to facilitate the actual combination of the two companies and sets the scene for the future effectiveness of the combined companies. The overarching goal of the PMI phase is the mitigation of value destruction, the exploitation of the value-adding potential, and the exploration of additional sources of value. Especially in the case of big pharma acquiring biotech start-ups, a successful integration is crucial as the objects of value preservation, exploitation, and exploration are innovations (biotech knowledge) and innovative capacity (biotech know-how). Due to the long time-horizon of innovations in biotechnology and the embeddedness of innovative capacity within the biotech's culture, people, and modus operandi, the importance of an effective integration strategy and integration management is amplified.

Bergamin and Braun (2018) propose two interconnected generic frameworks for successful post-merger integration, namely the "Five Factors that Make or Break an Integration Project" and the "Performance Transformation Concept." The authors prescribe the PMI success factors Leading Figures & Institutionalise Integration Office Responsibility, Availability of Resources & Take Care of Talents, Project Management & Introduce Integration Monitoring, Synergy Exploitation & Implement Performance Transformation, and Exploit the Momentum of Change & Exploit Growth Dynamics. The case analysis found strong evidence for the decisiveness of these generic PMI SFs, which validates the applicability of the two frameworks to the scope of M&As between big pharma companies and biotech start-ups.

Schweizer (2005b) proposes an industry-specific framework for successful post-merger integration in the context of large pharmaceutical companies acquiring small biotech companies, namely the "Hybrid Integration Approach Framework." The author prescribes a hybrid approach for a successful PMI, based on value chain segmentation for the simultaneous achievement of the short- and long-term M&A motives: (1) a slow preservation strategy for R&D value chain activities, granting the biotech autonomy without attempting a transfer of biotech know-how (innovative capacity) in order to achieve the long-term M&A motive (boost growth) and (2) a rapid absorption strategy for non-R&D value chain activities, providing the pharma with control and enabling the transfer of biotech knowledge (innovations) in order to achieve the short-term M&A motive (boost market position). Again, the case analysis found strong evidence for the decisiveness of these industry-specific PMI SFs, which validates the applicability of the framework to the scope of M&As between big pharma companies and biotech start-ups.

7.3 Big Pharma & Biotech Start-ups: Success Factors in Post-Merger Integration

7.3.1 Gap Analysis: Bridging Theory and Practice

The applicability of the reviewed integration success frameworks in the case of big pharma acquiring biotech start-ups is validated. However, there still is a need for additional elaborations in order to effectively bridge the gap between theory and practice.

The case analysis proved the importance of the generic success factors proposed by Bergamin and Braun (2018), which centre around **excellence in integration management and excellence in value creation**. However, two "gaps" could be identified. Firstly, R&D-focused biotech start-ups are mostly of small size and might not require as profound of an integration management as larger-scale acquisitions do, such as Actelion. This has been found especially true in regard to the creation of an institutionalised integration office, taking care of talents by facilitating leadership opportunities, and implementing a sophisticated and designated integration monitoring system. Nevertheless, good integration management is a necessity and should not be neglected due to a biotech's size or an M&A's context. Secondly, R&D-focused biotech start-ups are often integrated in a way that allows for the preservation of value as well as the exploitation of evident synergistic effects. However, the combination of the two companies in many cases also offers opportunities for value-adding transformation and change, which can only be grasped if an entrepreneurial long-term perspective is taken. Consequently, big pharma companies are not tasked with an easy feat in that they should pursue the right degree and type of synergy exploitation that allows for additional value creation, but without causing value destruction. Thus, excellence in value creation is even more of a necessity.

The case analysis also proved the importance of the industry-specific success factors proposed by Schweizer (2005b), which centre around **excellence in integration strategy and excellence in value creation**. However, three "gaps" could be identified. Firstly, R&D-focused biotech start-ups are typically still in preclinical or early clinical stages of drug discovery. Hence, the line of value chain segmentation is in practice often drawn after the PoC, while later tasks are taken over by big pharma. Secondly, fully integrated mature biotech start-ups might have other specific know-how which should be preserved, such as patient-centricity and business development expertise. This requires an adaption of the framework as it prescribes the full absorption of the non-R&D-related portion of the value chain. Thirdly, considerations of biotech know-how preservations are not only important for the integration design, but should also be applied in the negotiation phase and deal structuring as well as in the planning of subsequent reorganisations. Thus, value preservation is a multifaceted and infinite process.

7.3.2 Additional Success Factors from Best Practices and the Concluding Model

The case analysis enabled the identification of best practices in the integration of biotech start-ups into big pharma. These best practices are not fully accounted for by the reviewed theoretical frameworks and should, thus, be formulated into standalone scope-specific PMI SFs. Although evidence was found for the necessity of early strategic preparation and communication, these factors are rather generic and do not qualify as scope-specific PMI SFs for biotech start-up acquisitions by big pharma. Consequently, they can be seen as prerequisites for excellence in integration management and excellence in integration strategy. Based on the observed best practices, four specific PMI SFs are identified for biotech start-up integrations into big pharma:

(1) **Alignment to and commitment on a shared vision for genuine added value**: recognise the benefits of diversity in R&D and align/commit to it, achieve a truly synergistic partnership

(2) **Striking the balance between autonomy and coordination**: retain the biotech's modus operandi, but establish ties into the rest of the organisation to transform it into a team effort

(3) **Preserving individualism and facilitating collectivism to achieve the best of both worlds**: retain the unique biotech culture, but build bridges to enable identification with the parent organisation and create a sense of "togetherness"

(4) **Path the road to success by encouraging entrepreneurialism and empowering people/ ideas**: nurture the biotech's entrepreneurial spirit and act as a catalyst for growth and innovation

Conclusively, the following model was created to summarise the findings on success factors and best practices for the post-merger integration of biotech start-ups into big pharma:

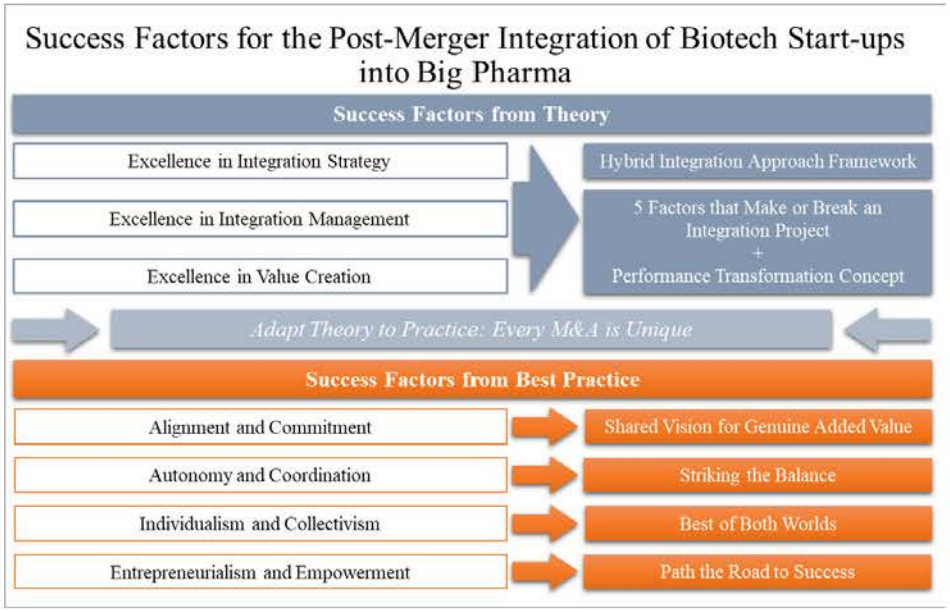

Figure 16: Concluding Model on Success Factors for the Integration of Biotech Start-ups into Big Pharma. Own Creation.

8 Conclusion

M&As have become a regular occurrence in the life science sector, if not even an integral part of the business model of big pharma, which are on an endless quest for corporate renewal in response to challenges to their industry dominance. Especially research-based big pharma companies, whose competitive advantage lies in the discovery and development of novel and differentiated medicines, find themselves under pressure to live up to the expectations of originating new breakthrough innovations which are value-adding enough to provide the aspired revenue growth. History, however, has shown that a "new" generation of life science players, the entrepreneurial biotechs, have been more successful at originating new innovations than big pharma. Alcide Barberis (2020), one of the featured interview partners, states that "it is a lost race for the pharma companies, not because they don't have skills or money, but because the setup is different. In biotech companies, you have enthusiasm, you have flexibility, you have people coming fresh out of the academic research. It's a totally different environment, much more creative, much more flexible and research-oriented." Consequently, it is no surprise that big pharma has long ago embarked on a trend to acquire biotech start-ups. M&As, however, are a complex undertaking, especially for big pharma acquiring biotech start-ups, and require much more than the acquisition in itself to turn into a success. In fact, the post-merger integration phase is key in delivering the expected results of the M&A.

The aim of this thesis was to investigate the success factors in the post-merger integration of Swiss biotech start-ups into big pharma. For this purpose, this paper tested the applicability of post-merger integration theories established by Bergamin and Braun (2018) and Schweizer (2005b) in the context of "big pharma acquires and integrates Swiss biotech start-ups." In addition, this paper aimed at bridging the gap between theory and practice as well as identifying best practices which could be reformulated into additional scope-specific success factors. Finally, as integration success to some degree depends on the underlying acquisition rationale of the acquirer, this paper further tested three hypotheses on M&A trends and motives based on propositions by Kurmann Partners (2017) and Schweizer (2005b).

To test the introduced hypothesis on M&A trends as well as to situate the case studies and research findings, a high-level trend analysis of "big pharma acquires Swiss biotech" was made on the basis of historical data on M&A transactions as well as information gathered through desk research. Subsequently, to test the hypotheses on M&A motives and answer the research questions, a qualitative case study approach was used, which enabled an in-depth analysis of three post-merger integration cases on the basis of information gathered through

desk research and interviews. The cases featured in the analysis were: GlycArt and Roche, ESBATech and Alcon/Novartis, Actelion and Johnson & Johnson.

The high-level trend analysis provided strong evidence for hypothesis 1, namely that big pharma of the Originator archetype predominantly acquires Swiss biotechs which identify as Innovators. Moreover, it was found that Originators predominately acquire privately held R&D-focused start-ups and undertake M&As with the rationale of strengthening the R&D in their core business segments/therapeutic areas. In the case analysis, strong evidence was found for the hypotheses 2 and 3, namely that big pharma, especially of the Originator archetype, has the short-term motive to access external innovations and the long-term motive to access external innovative capacity through biotech acquisitions. The case study analysis of a diverse selection of post-merger integration scenarios (diversified in buyer archetypes, target maturity levels, M&A structure and contexts) validated the applicability of the reviewed integration success frameworks for "big pharma integrates Swiss biotech start-up" and also found strong evidence for the importance of their application to achieve a successful M&A outcome. Moreover, the discussion of the findings illustrated the gap between theory and practice and successfully identified additional best practices which qualify as scope-specific PMI success factors.

Conclusively, the SFs for the integration of biotech start-ups into big pharma are *from theory*: Excellence in (1) Integration Strategy, (2) Integration Management, and (3) Value Creation, and *from best practice*: (i) Alignment and Commitment: Shared Vision for Genuine Added Value, (ii) Autonomy and Coordination: Striking the Balance, (iii) Individualism and Collectivism: Best of Both Worlds, (iv) Entrepreneurialism and Empowerment: Path the Road to Success. The newly established scope-specific PMI SFs from best practice do not only ensure that the integration of a biotech start-up is successful in preserving and creating value as well as in delivering on the identified M&A motives, they also in a way support big pharma in mastering the transformation towards more agility and innovativeness. This, in turn, could make partnerships, including M&As, between big pharma and biotech start-ups more value-adding in general, which in the end benefits patients in need for improved health care solutions. An important aspect to consider is, however, that every M&A is unique and, therefore, requires a customer-tailored post-merger integration approach. The established PMI SFs, whether from theory or from best practice, should be adapted to the particular situation of the M&A and the characteristics of the companies involved in the transaction. Nevertheless, the need for adaptation does not endorse inferior performance or complete neglection of the success factors, as this could quickly turn into a pitfall for the integration project. Moreover, it was found that the general applicability of the PMI SFs does not differ much between young R&D-focused

biotechs and mature fully integrated biotechs. This implies that biotech start-ups, regardless of their growth stage or business model, share the same underlying need for preserving their passion for research and their innovative capacity, that is, the know-how derived from the people, culture, modus operandi, and entrepreneurial spirit. In sum, big pharma should take a long-term perspective when acquiring and integrating a biotech start-up, recognise the underlying needs and value propositions of the biotech, and design an M&A/integration that is of mutual beneficial nature and might aid in transforming the internal research environment of those big pharma companies which have not been able to keep up their innovativeness.

This thesis succeeded in answering the research question as well as testing the introduced hypotheses. Moreover, it promoted the understanding of the complexity of post-merger integration between big pharma and biotech start-ups by reviewing theory on the subject-matter, providing an overview of the industries and the need for inter-industry collaboration, highlighting M&A trends in Switzerland, examining practical cases of post-merger integration projects, while introducing first-hand insights from target company representatives, and bridging the gap between theory and practice by validating or introducing integration success factors and best practices for big pharma/biotech start-up M&As.

However, this paper also has some limitations. Firstly, the time and length restraints of the bachelor thesis required a prioritisation in research scope and depth. Consequently, only the most important M&A concepts and industry characteristics were discussed. Moreover, the paper focused on providing the necessary medical definitions without elaborating on the underlying science. Secondly, the scope constraints only allowed a high-level trend analysis of eleven M&As and a practical examination of only three post-merger integration case studies, which restricts the significance of the findings. Thirdly, the limited information publicly available as well as the focus of the interviews on target company representatives might have resulted in certain information gaps and unintended bias in the case study analysis.

This paper proposes several areas for further research. The vast body of literature available on post-merger integration as well as on industry challenges and trends offers ample opportunity for further review. Moreover, an in-depth trend analysis with a larger sample of M&As, outside of Switzerland, is recommended to verify and expand on the trends and motives for biotech acquisitions. In addition, the analysis of further integration cases would enable the validation of the research findings, possibly using M&As identified in the trend analysis. Finally, the success factors from theory as well as the newly identified ones from best practice could be tested through a practical application in an actual integration project.

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10 Appendix

10.1 Big Pharma-Swiss Biotech M&A Transactions

Year	Target Company	Country	Public	PE/VC-Backed	Buyer	Country	Overall Deal Value ($m)	VC Investment ($m)	Stage of Lead Product	Therapeutic Areas(s)
2005	GlycArt	Switzerland	Private	VC	Roche	Switzerland	181	20	0	N/A[2]
2006	Fumapharm	Switzerland	Private		Biogen Idec	US	500		2[3]	CNS
2008	Speedel	Switzerland	Public		Novartis	Switzerland	880		Market	Asthma, allergy
2008	Alcon (Option)	US	Public		Novartis	Switzerland	11'000		Market	Ophthalmology
2009	ESBATech	Switzerland	Private	VC	Alcon	Switzerland	589	110	1	Ophthalmology
2010	Alcon	US	Public		Novartis	Switzerland	41'200		Market	Ophthalmology
2011	Nycomed	Switzerland	Private	PE	Takeda	Japan	13'680		Market	OTC, gastro, pain
2013	Okairos	Switzerland	Private	VC	GlaxoSmithKline	UK	323	31	2	Vaccines
2014	OncoEthix	Switzerland	Private	VC	Merck & Co.	US	375	30	1	Oncology
2015	GlycoVaxyn	Switzerland	Private	VC	GlaxoSmithKline	UK	190	42	1	Vaccines
2017	Actelion Pharmaceuticals Ltd.[4]	Switzerland	Public		Johnson & Johnson	US	30'000		Market	PAH, cardiovascular
2019	Therachon	Switzerland	Private	VC	Pfizer	US	810	100	1	Genetic diseases, achondroplasia
2019	Amal Therapeutics	Switzerland	Private	VC	Boehringer Ingelheim	Germany	366	45	0	Cancer IO and vaccines

Source: "Pharma / Biotech M&A Transactions 2005-2019" (HBM Partners, 2020b).

[2] Information Missing: GlycArt Biotechnology GmbH specialised in the therapeutic area of oncology (Umaña, 2020).
[3] Incorrect: As of 2006, FUMADERM(R) was already on the market (Biogen Idec & Fumapharm, 2006).
[4] Incorrect: Johnson & Johnson acquired Actelion Ltd., of which Actelion Pharmaceuticals Ltd. is a subsidiary. Entry details related to acquisition of Actelion Ltd., the Holding Company and not the subsidiary (Johnson & Johnson & Actelion, 2017).

10.2 Classification of Buyers

Roche → Originator

- Research-based healthcare company (Reuters, n.d.-i)
- Kurmann Partners: Originator (Leutenegger & Bieri, 2016)
- Segments: Pharmaceuticals & Diagnostics (Reuters, n.d.-i)

Biogen (Idec) → Originator

- Biopharmaceutical company (Reuters, n.d.-c)
- Segments: Multiples Scleroses, Spinal Muscular Atrophy, Alzheimer's Disease, Biosimilars (Biogen, n.d.)

Novartis → Originator

- Holding company providing a range of healthcare products led by pharmaceuticals (Reuters, n.d.-g)
- Kurmann Partners: Originator (Leutenegger & Bieri, 2016)
- Segments: Innovative Medicines, Alcon, Sandoz (generics), Corporate Activities (Reuters, n.d.-g)
    - Former Alcon Division was spun-off in 2019 (Alcon, 2019)
    - Sandoz Division
        - Kurmann Partners: Low-Cost Providers (Leutenegger & Bieri, 2016)

Alcon → Point-of-Call Specialist

- Switzerland-based company mainly active nowadays in medical industry and focusing on eye care devices (Reuters, n.d.-b)
- Segments: Surgical and Vision Care (Reuters, n.d.-b)
    - Before the acquisition by Novartis, Alcon had a third business segment: Pharmaceuticals (Alcon, 2009a)

Takeda → OTC / Consumer Health (Transitioning towards Originator)

- Japan-based company focusing on the pharmaceutical business (Reuters, n.d.-a)
- Segments: pharmaceutical products, general medical products, quasi drugs, healthcare products (Reuters, n.d.-a)
- R&D Segments: Oncology, Digestive System Diseases, Rare Diseases, Neurology, Plasma Fractionation Products, Vaccines (Reuters, n.d.-a)

- Transition towards Originator Justification:
    - In 2000, Takeda announced the divestment of non-pharmaceutical businesses (incl. animal health, bulk vitamins, chemicals, food, agriculture, life-environment) as part of its growth strategy (Takeda, n.d.)
    - In 2014, Takeda announced a reorganisation into the therapeutic areas of central nervous system, cardiovascular & metabolic, gastroenterology, and oncology. With additional two speciality business units for oncology and vaccines (Takeda, 2014)
    - In 2020, Takeda announced the divestment of certain OTC and none-core assets
        - Business Wire, Costa Saroukos (CFO Takeda): "This transaction represents the continued execution of our strategy to simplify our portfolio and accelerate deleveraging. We remain focused on investing in our key business areas as we continue strengthening our position as a R&D-driven global biopharmaceutical leader and deliver enhanced value for patients and Takeda shareholders." (Takeda, 2020)

GlaxoSmithKline → OTC / Consumer Health (Transitioning towards Originator)

- Global healthcare company (Reuters, n.d.-d)
- Kurmann Partners: OTC / Consumer Health (Leutenegger & Bieri, 2016)
- Segments: Pharmaceuticals, Vaccines, Consumer Healthcare (GlaxoSmithKline, n.d.-a)
- In Transition towards Originator Justification:
    - In 2015, GSK and Novartis made an asset swap. GSK bought part of the Novartis' vaccine business and sold its mature (excl. early stage) oncology business (GlaxoSmithKline, n.d.-b)
    - In 2019, company announced Joint Venture with Pfizer and Demerger of Consumer Healthcare in order to focus on Pharmaceuticals/Vaccines (GlaxoSmithKline, n.d.-a)

Merck & Co. → Originator

- Global healthcare company (Reuters, n.d.-f)
- Kurmann Partners: Originator (Leutenegger & Bieri, 2016)
- Segments: Pharmaceuticals, Animal Health, Healthcare Services, Alliances (Reuters, n.d.-f)
- Product Groups: prescription medicines, vaccines, biologic therapies, animal health (Reuters, n.d.-f)

Johnson & Johnson → OTC / Consumer Health

- Holding company with a diversified product portfolio for the healthcare field (Reuters, n.d.-e)
- Kurmann Partners: OTC / Consumer Health (Leutenegger & Bieri, 2016)
- Segments: Consumer Health Care, Pharmaceuticals, Medical Devices (Reuters, n.d.-e)

Pfizer → Originator (but also OTC / Consumer Health & Low-Cost Provider)

- Research-based global biopharmaceutical company (Reuters, n.d.-h)
- Segments: Innovative Medicines (novel medicines, biosimilars, hospital medicines), Established Medicines (legacy brands, generics), Consumer Health Care (OTC) (Kilgore, 2018)
    - Before the reorganisation, the business segments were: Pfizer Innovative Health (medicines, vaccines) & Pfizer Essential Health (legacy brands, generics, biosimilar, sterile injectables, infusion systems) (Reuters, n.d.-h)

Boehringer Ingelheim → Originator

- Research-driven Pharmaceutical Company (Bloomberg, n.d.) (Boehringer Ingelheim, 2020)
- Segments: Human Pharma, Animal Health, Biopharmaceutical Contract Manufacturing (Boehringer Ingelheim, 2020)

10.3 Classification of Targets and Strategic Purpose of M&A

GlycArt → R&D-focused, Hybrid, Start-up, Innovator

- Background:
  - Launched in 2000, VC Funding: Series A (2003)

  Source: (Crunchbase, n.d.-i)
- Value Proposition:
  - Wessel: "For GlycArt, the early sale confirms the wisdom of the company's hybrid strategy of licensing in companies to use its patented technology while simultaneously developing its own product candidates."
  - Swiss Biotech Association: "Glycart Biotechnology […] recognized for its role as pioneer in antibody engineering for cancer immunotherapy."

  Source: (Swiss Biotech Association, 2019a; Wessel, 2005)
- Products:
  - GA101, pre-clinical stage humanized antibody product
    - Indication 1: treatment of lymphocytic leukemia
    - Indication 2: treatment of follicular lymphoma
  - GA201, GA301, GA401, GA501, lead generation or preclinical-stage
    - Indication: treatment of cancer

  Source: (Jean-Mairet, 2011; Swiss Biotech Association, n.d.; William Reed, 2005)
- Technology:
  - Proprietary GlycoMab glycosylation technology

  Source: (Swiss Biotech Association, n.d.; William Reed, 2005)
- Strategic Purpose of M&A for Roche:
  - William Reed: "Roche has acquired GlycArt Biotechnology in an attempt to further strengthen Roche's capabilities in the therapeutic antibody research sector."
  - William Reed, Franz Humer (CEO Roche): "This acquisition is an excellent strategic fit with our Therapeutic Protein Initiative and our focus on developing clinically differentiated proteins and antibodies for areas of unmet medical need, such as oncology."
  - William Reed: "GlycoMab […] has the potential to generate best-in-class antibody therapeutics in disease areas such as oncology, where Roche is the global market leader."
  - William Reed: "Roche will acquire GlycArt's development pipeline."

  - Swiss Biotech Association: "The acquisition of Glycart by Roche secured 'big pharma' access to the biotech's innovative proprietary GlycoMAb technology and to its Glyco- MAb-enhanced drug candidates, in particular GA101."

Source: (Swiss Biotech Association, n.d.; William Reed, 2005)

Fumapharm → R&D-focused, Product-oriented, No Start-up, Innovator

- Background:
  - Launched in 1983, VC Funding: N/A

Source: (Crunchbase, n.d.-d)

- Value Proposition:
  - "Fumapharm AG […] develops therapeutics derived from fumaric acid esters for patients with high unmet medical need."

Source: (Biogen Idec & Fumapharm, 2006)

- Products:
  - FUMADERM(R), commercial-stage product (marketed only in Germany)
    - Indication: treatment of psoriasis (dermatology)
  - BG-12, clinical-stage product
    - Indication: treatment of multiple sclerosis (MS) and psoriasis
    - Joint development with Biogen Idec

Source: (Biogen Idec & Fumapharm, 2006)

- Technology: N/A
- Strategic Purpose of M&A for Biogen Idec:
  - James C. Mullen (CEO Biogen): "This acquisition supports our goal of developing innovative therapeutic options for people living with MS."
  - James C. Mullen (CEO Biogen): "We look forward to continuing the development of BG-12 […] as well as expanding our European operations by working with Fumapharm's existing partners to provide FUMADERM to psoriasis patients in Germany."

Source: (Biogen Idec & Fumapharm, 2006)

Speedel → R&D-focused, Product-oriented, Start-up, Innovator

- Background:
  - Launched in 1998/2001, VC Funding: Unknown Series (2002, 2005)

Source: (Crunchbase, n.d.-j; Morrison, 2008)

- Value Proposition:
  - "Speedel is a […] world leader in developing renin inhibition, a promising new approach with significant potential for treating cardiovascular diseases."
  - Offices in Basel (CH), New Jersey (US), and Tokyo (JP)

  Source: (Novartis, 2008)
- Products:
  - Tekturna/Rasilez, commercial-stage product
    - Indication: treatment of hypertension
    - Joint development with Novartis
    - Manufacturing/commercialisation by Novartis
  - SPP635, SPP1148, & SPP676, clinical-stage products
    - Follow-on direct renin inhibitor projects
    - Indication: treatment of hypertension
  - SPP2745, preclinical-stage product
    - Adosterone synthase inhibitor class
    - Indication: treatment of cardiovascular diseases

  Source: (Novartis, 2008)
- Technology: N/A
- Strategic Purpose of M&A for Novartis:
  - "Speedel pipeline provides access to many R&D projects targeting cardiovascular disease, including a range of direct renin inhibitors."
  - "Ownership of Speedel provides greater flexibility and speed in development of Tekturna/Rasilez and also ends royalty and manufacturing fee payments."
  - "R&D pipeline is a strong fit with the leading global position of Novartis in cardiovascular disease."
  - Joseph Jimenez (CEO Novartis): "With the integration of Speedel into Novartis, we can accelerate development of Tekturna/Rasilez, particularly in combination with other medicines, and further advance Speedel's pipeline of novel compounds."

  Source: (Novartis, 2008)

ESBATech → R&D-focused, Hybrid, Start-up, Innovator

- Background:
  - Launched in 1998, VC Funding: Series A (2002), Series B (2006 & 2008)

Source: (Crunchbase, n.d.-c)

- Value Proposition:
  - "ESBATech […] has been developing a pipeline of proprietary single-chain antibody fragment therapeutics for topical and local delivery for safe and convenient therapy."
  - "ESBATech applies its proprietary screening platform IMMUNA and its fully human single-chain antibody frameworks to generate product candidates against targets of clinical relevance."
  - Application of technology and single-chain antibody frameworks in ophthalmology, rheumatology and respiratory
    - Transaction includes spin-off of technology application outside of ophthalmology into new company (Delenex Therapeutics AG)

  Source: (Alcon, 2009b)
- Products:
  - ESBA105, clinical-stage product
    - Indication: treatment of inflammatory ocular disease
  - ESBA1008/ESBA903, preclinical-stage product/s
    - Indication: treatment of age-related macular edema

  Source: (Escher, 2011; GEN Magazine, 2009; Greater Zurich Area, 2019)
- Technology:
  - proprietary antibody fragment technology and screening platform IMMUNA

  Source: (Alcon, 2009b)
- Strategic Purpose of M&A for Alcon:
  - "Company gains access to proprietary antibody fragment technology particularly suited to treat eye diseases."
  - "Acquisition establishes sustainable platform for ongoing biologics development."
  - "The ESBATech acquisition expands Alcon's research capability outside of small molecules to the promising field of proteins, antibodies and other large molecules."
  - "Deal […] to expand breadth and depth of Alcon's development opportunities in eye care in the long term."
  - Kevin Buehler (CEO Alcon): "This acquisition is part of our ongoing strategy to enhance access to multiple sources of technologies and compounds that

bolster our total research platform in support of innovative products to treat eye disease."

- Sabri Markabi (Alcon Executive): "Combining ESBATech's proprietary antibody fragment technology with our expertise in ophthalmic formulation and capabilities in global development will strengthen Alcon's leadership position in ophthalmology."

Source: (Alcon, 2009b)

Nycomed → Fully Integrated, Product-oriented, No Start-up, Manufacturing/Sales Expert

- Background:
  - Launched in 1874, VC Funding: N/A

  Source: (Crunchbase, n.d.-f)
- Value Proposition:
  - "Nycomed is a […] global pharmaceutical company with a diversified portfolio focused on branded medicines in gastroenterology, respiratory and inflammatory diseases, pain, osteoporosis and tissue management. A range of OTC products completes the portfolio."
  - "Its key success factors include the utilization of its broad product range and the application of commercialization and development strategies that fit with the market environment and medical needs in each individual country and region."
  - R&D: collaborations & in-licensing
  - Sales Platforms: Europe & Emerging Markets (incl. Russia/CIS, Latin America, Asia, Middle East)
  - Sales Partnerships: US & Japan

  Source: (Takeda & Nycomed, 2011)
- Products:
  - Diversified portfolio, commercial-stage products
    - Established prescription pharmaceutical products (core product group)
    - OTC products

  Source: (Takeda & Nycomed, 2011)
- Technology: N/A

- Strategic Purpose of M&A for Takeda:
    - Yasuchika Hasegawa (CEO Takeda): "Nycomed enables Takeda to maximize the value of our portfolio and gives us an immediate strong presence in the high-growth emerging markets while doubling Takeda's European sales."
    - Hakan Bjorklund (CEO Nycomed): "The combination of Takeda's successful track record of innovation with Nycomed's efficient commercialization and manufacturing infrastructure will create a global player with a phenomenal ability to bring medicines to patients and healthcare providers around the world."
    - "Strong fit with Takeda's sustainable growth strategy
        - Strengthens pan-European platform
        - Leverages Nycomed's emerging markets strength to drive growth
        - Allows Takeda to maximize the value of its portfolio supported by enhanced development expertise and commercialization capability in Europe and emerging markets
        - Provides a significant growth driver with roflumilast (Daxas® tradename in Europe)"

Source: (Takeda & Nycomed, 2011)

Okairos → R&D-focused, Hybrid, Start-up, Innovator

- Background
    - Launched in 2007, VC Funding: Series A (2007), Series B (2010)

Source: (Crunchbase, n.d.-g)

- Value Proposition:
    - "Okairos AG […], a specialist developer of vaccine platform technologies".
    - "Okairos is […] developing genetic vaccines for major infectious diseases […] using a novel proprietary technology."

Source: (GlaxoSmithKline, 2013)

- Products:
    - Genetic vaccines, preclinical- or clinical-stage products
        - Indication: prevention/treatment of respiratory syncytial virus, hepatitis C, malaria, tuberculosis, ebola, HIV, cancer
    - Therapeutic vaccines, preclinical- or clinical-stage products
        - Indication: treatment of cancer

Source: (GlaxoSmithKline, 2013)

- Technology:
  - Novel proprietary vaccine platform technology
    - novel viral vectors (cell penetration) targeting the stimulation of immune responses (T-cells)

Source: (GlaxoSmithKline, 2013)

- Strategic Purpose of M&A for GSK:
  - "GSK to further expand its vaccines platform technology expertise through strategic acquisition."
  - "The acquisition reinforces GSK's commitment to investment in innovative science."
  - "Okairos […] has developed a novel vaccine platform technology which is expected to play an important role in GSK's development of new prophylactic vaccines […] as well as new classes of therapeutic vaccines […]."
  - "Okairos' technology complements GSK's existing vaccine technology and expertise and will enable GSK to continue its work developing the next generation of vaccines."
  - Riccardo Cortese (CEO Okarios): "GSK is best-placed to maximise this opportunity to potentially transform the vaccines landscape."
  - "GSK will […] assume ownership of early stage assets […] supplementing the company's existing vaccines pipeline."
  - "GSK and the Okairos management team are committed to […] develop ways of working that will maintain the autonomy, spirit and agility of this unique small biotech firm which will be strengthened by the support and advantages that GSK can provide."

Source: (GlaxoSmithKline, 2013)

OncoEthix → R&D-focused, Product-oriented, Start-up, Innovator

- Background
  - Launched in 2007, Funding: Series A (2012), Series B (2013)

Source: (Crunchbase, n.d.-h)

- Value Proposition:
  - "OncoEthix, a […] Oncology Company Developing Novel BET Inhibitors for Hematological and Solid Cancers".

  - "OncoEthix is […] aiming to develop a small portfolio of oncology drug candidates."

Source: (Merck & Co., 2014)

- Products:
  - OTX015, clinical-stage product
    - Indication 1: treatment of hematological malignancies
    - Indication 2: treatment of advanced solid tumours
    - Business Wire: "OTX015 was in-licensed from Mitsubishi Tanabe Pharma Corporation in March 2012"
    - Biospace: "MTPC […] licensed the compound to OncoEthix to take advantage of its expertise in the development of novel oncology drugs."
  - OTX008, clinical-stage product
    - Indication: treatment of cancer

Source: (Merck & Co., 2014; OncoEthix, 2012)

- Technology: N/A
- Strategic Purpose of M&A for Merck:
  - "Expands Merck's Oncology Portfolio with Novel Oral BET Inhibitor, OTX015"
  - Roy Baynes (Merck Executive): "Oncology is a priority area of focus for Merck and the acquisition of OncoEthix supports our strategy to prioritize the development of innovative molecules with the potential to improve the treatment of advanced cancers."
  - Roy Baynes (Merck Executive): "OTX015 […] strategically complements our broad immuno-oncology development program."
  - Bertrand Damour (CEO OncoEthix): "Merck best positions OTX015 to be developed to its full potential in areas of high unmet medical need."

Source: (Merck & Co., 2014)

GlycoVaxyn → R&D-focused, Hybrid, Start-up, Innovator

- Background
  - Launched in 2004, VC Funding: Seed (2006), Series A (2007), Series B (2009)

Source: (Crunchbase, n.d.-e)

- Value Proposition:
  - "GlycoVaxyn AG […] is focused on the development of next-generation bioconjugate vaccines against bacterial infections, utilizing its versatile and innovative bioconjugation platform."

  Source: (GlaxoSmithKline, 2015)
- Products:
  - Bioconjugate vaccines, preclinical- or clinical-stage products
    - Indication: prevention/treatment of bacterial infections (pneumonia, Pseudomonas, Staphylococcus aureus, Shigellosis)

  Source: (GlaxoSmithKline, 2015)
- Technology:
  - Innovative biological conjugation platform technology

  Source: (GlaxoSmithKline, 2015)
- Strategic Purpose of M&A for GSK:
  - "GSK strengthens early stage vaccine pipeline with acquisition of GlycoVaxyn AG."
  - "GlycoVaxyn has developed a […] platform technology which has the potential to play an important role in the development of new prophylactic and therapeutic vaccines for a range of bacterial diseases."
  - "The proprietary technology also has the potential to enable GSK to develop a simplified conjugate vaccine manufacturing process."
  - "GSK will additionally acquire a small number of early stage vaccines […] supplementing the company's existing vaccines pipeline."
  - Moncef Slaoui (GSK Chairman): "This is an exciting opportunity to expand our research efforts to develop a new generation of vaccines for common and severe bacterial infections, for many of which there are currently no effective vaccines. It reinforces our commitment to seek out and invest in great science and complements our proposed transaction with Novartis which will strengthen our leading position in vaccines."
  - Phillipe Dro (CEO GlycoVaxyn): "[W]e are delighted to be working even more closely with one of the leading vaccine companies in the world".
  - "GSK and the GlycoVaxyn management team are committed to […] develop ways of working that will maintain the autonomy, spirit and agility of this unique

small biotech firm which will be strengthened by the support and advantages that GSK can provide."

Source: (GlaxoSmithKline, 2015)

Actelion Ltd → Fully Integrated, Product-oriented, Start-up, Innovator

- Background
  - Launched in 1997, VC Funding: Unknown Series (1998)

  Source: (Crunchbase, n.d.-a)
- Value Proposition
  - J&J and Actelion: "Actelion Ltd. is a leading biopharmaceutical company focused on the discovery, development and commercialization of innovative drugs for diseases with significant unmet medical need."
  - J&J and Actelion: "Actelion is a leader in the field of pulmonary arterial hypertension (PAH)."
  - Market Coverage: Global key markets (incl. Europe, the US, Japan, China, Russia, Mexico)

  Source: (Duato, 2017; Johnson & Johnson & Actelion, 2017)
- Products:
  - PAH Portfolio, commercial-stage products
    - Indications: treatment of the whole disease spectrum (from WHO Functional Class II to Functional Class IV)
  - Specialist diseases portfolio, commercial-stage products
    - Indications: treatment of i.e. Type 1 Gaucher disease, Niemann-Pick type C disease, Digital Ulcers, T-cell lymphoma
  - Early-stage clinical development assets
    - Transaction includes spin-off of early-stage R&D products into new company (Indorsia AG), in which Johnson and Johnson has a minority stake
    - Includes ACT-132577, clinical-stage product
      - Indication: treatment of resistant hypertension
      - Johnson & Johnson retains option for development and commercialisation

  Source: (Duato, 2017; Johnson & Johnson & Actelion, 2017)
- Technology: N/A

- Strategic Purpose of M&A for Jonson & Johnson:
    - J&J and Actelion: "Actelion has established a leading franchise of differentiated, innovative products for pulmonary arterial hypertension (PAH) that is highly complementary to the existing portfolio of the Janssen Pharmaceutical Companies of Johnson & Johnson."
    - J&J and Actelion: "The addition of Actelion's specialty in-market medicines and late-stage products is consistent with Johnson & Johnson's efforts to grow in attractive and complementary therapeutic areas and serve patients with serious illnesses and significant unmet medical need."
    - J&J and Actelion: "[T]he transaction structure will provide Johnson & Johnson flexibility to accelerate investment in its industry-leading, innovative pipeline to drive additional growth."
    - Joacquin Duato (JnJ Chairman and Executive VP): "Actelion brings to Johnson & Johnson a best-in-class, paradigm-shifting portfolio of medicines that can help address an important medical need: pulmonary arterial hypertension."
    - Joacquin Duato (JnJ Chairman and Executive VP): "The Janssen pharmaceutical companies of Johnson & Johnson have been working in five therapeutic areas—neuroscience; infectious diseases and vaccines; immunology; oncology; and cardiovascular and metabolic diseases—and this acquisition will provide our sixth."
    - Joacquin Duato (JnJ Chairman and Executive VP): "Johnson & Johnson and Actelion will combine our individual capabilities and expertise to further identify opportunities to reach more patients with PAH, as well as identify new geographies in which Actelion has not had a footprint to extend the medicines to those areas."
    - Joacquin Duato (JnJ Chairman and Executive VP): "We will also work with the global medical PAH community to further enhance the scope of available treatment strategies and develop next generation therapies that could potentially help patients five to 10 years from now."

Source: (Duato, 2017; Johnson & Johnson & Actelion, 2017)

Therachon → R&D-focused, Product-oriented, Start-up, Innovator

- Background:
    - Launched in 2014, VC Funding: Series A (2015 & 2017), Series B (2018)

Source: (Crunchbase, n.d.-k)

- Value Propositions:
  - "Therachon is […] focused on the discovery and development of innovative treatment for severe, rare conditions with significant unmet need"
  - "The company is currently advancing a pipeline of therapeutics focused on rare gastrointestinal and musculoskeletal disorders and conditions, including both achondroplasia and short bowel syndrome"

  Source: (Pfizer, 2019)
- Products:
  - TA-46, clinical-stage product
    - Indication: treatment of achondroplasia (short-limbed dwarfism)
  - Apraglutide, clinical-stage product
    - Indication: treatment of short bowel syndrome
    - M&A includes spin-off of Apraglutide program into new company (VectivBio) in which Pfizer Ventures holds a minority stake

  Source: (Pfizer, 2019)
- Technology: N/A
- Strategic Purpose of M&A for Pfizer:
  - Mikael Dolsten (Pfizer Executive) "By acquiring Therachon, we hope to leverage Pfizer's leading scientific and development capabilities to more rapidly advance this potentially promising therapy for people with achondroplasia."
  - Luca Santarelli (CEO Therachon): "With its rare disease expertise and worldwide reach, Pfizer is well positioned to accelerate the development of TA-46 and fulfill Therachon's vision of addressing the complications suffered by children with achondroplasia by targeting the molecular root causes of this condition."
  - Seng Cheng (Pfizer Executive) "Pfizer's existing research programs for pediatric growth disorders provide a complementary setting for this potential breakthrough therapy."
  - "Expands Pfizer's rare disease portfolio with potential first-in-class therapy for achondroplasia."

  Source: (Pfizer, 2019)

Amal Therapeutics → R&D-focused, Hybrid, Start-up, Innovator

- Background:
  - Founded: 2012, VC Funding: Seed (2014), Series A (2016), Series B (2017 & 2018)

  Source: (Crunchbase, n.d.-b)
- Value Proposition:
  - "Amal is focused on cancer immunotherapy and advancing first-in-class therapeutic cancer vaccines derived from its technology platform KISIMA"

  Source: (Swiss Biotech Association, 2019b)
- Products:
  - ATP128, clinical-stage product
    - Indication: treatment of IV colorectal cancer

  Source: (Swiss Biotech Association, 2019b)
- Technology:
  - KISIMA platform technology
    - "AMAL's first-in-class proprietary KISIMA® platform leverages peptide/protein-based vaccination technology"
    - "AMAL's proprietary technology platform KISIMA enables the assembly of three functional components into one patented fusion protein used as a vaccine"

  Source: (Swiss Biotech Association, 2019b)
- Strategic Purpose of M&A for Boehringer Ingelheim:
  - "Acquisition adds key platform supporting Boehringer Ingelheim's focus on patients with difficult-to-treat gastrointestinal and lung cancers."
  - "Boehringer Ingelheim plans to develop new therapies by combining assets from its cancer immunology portfolio with AMAL's proprietary KISIMA immunization platform."
  - Michael Pairet (Boehringer Ingelheim BOD): "Acquiring AMAL is part of Boehringer Ingelheim's long-term strategy to enhance our existing position as an innovator of novel cancer therapies, including immuno-oncology treatments, which leverage cutting-edge scientific discoveries and their applications"
  - Michael Pairet (Boehringer Ingelheim BOD): "We want to pioneer new paradigms of biology-based care for cancer patients, and the technologies and expertise developed at AMAL are critical to our efforts"

- "The AMAL acquisition […] significantly strengthens Boehringer Ingelheim's strategic focus on immune cell-directed therapies."

Source: (Swiss Biotech Association, 2019b)

10.4 Classification of Transactions

Acquisition → Major Impact Area	**Acquisition** → Classification & Purpose
Roche – Glycart • Business Segment: Pharmaceuticals (core) • Therapeutic Area: Oncology (core) • Value Chain: R&D	**Originator acquires Innovator** ➔ To strengthen R&D in core business segment for core therapeutic area
Biogen Idec – Fumapharm • Business Segment: Pharmaceuticals (core) • Therapeutic Area: Multiples Scleroses (core) • Value Chain: R&D and Marketing & Sales (only DE)	**Originator acquires Innovator** ➔ To strengthen R&D in core business segment for core therapeutic area
Novartis – Speedel • Business Segment: Pharmaceuticals (core) • Therapeutic Area: Cardiovascular (core) • Value Chain: R&D	**Originator acquires Innovator** ➔ To strengthen R&D in core business segment for core therapeutic area
Merck & Co. - OncoEthix • Business Segment: Pharmaceuticals (core) • Therapeutic Area: Oncology (core) • Value Chain: R&D	**Originator acquires Innovator** ➔ To strengthen R&D in core business segment for core therapeutic area
Boehringer Ingelheim – Amal Therapeutics • Business Segment: Pharmaceuticals (core) • Therapeutic Area: Oncology (core) • Value Chain: R&D	**Originator acquires Innovator** ➔ To strengthen R&D in core business segment for core therapeutic area
Alcon – Esbatech • Business Segment: Pharmaceuticals (core) • Therapeutic Area: Ophthalmology (core) • Value Chain: R&D **Novartis - Alcon** • Business Segment: Various (core/non-core) • Therapeutic Area: Ophthalmology (non-core) • Value Chain: all	**Point-of-Call Specialist acquires Innovator** ➔ To strengthen R&D in core business segment for core therapeutic area **Originator acquires Point-of-Call Specialist** ➔ To expand core and non-core business segments for none-core therapeutic area
Pfizer – Therachon • Business Segment: Pharmaceuticals (core) • Therapeutic Area: Rare Diseases (core) • Value Chain: R&D	**Originator acquires Innovator** ➔ To strengthen R&D in core business segment for core therapeutic areas
GlaxoSmithKline – Okairos • Business Segment: Vaccines (new core) • Therapeutic Area: Prophylactic/Therapeutic Vaccines (core) • Value Chain: R&D	**OTC / Consumer Health acquires Innovator** ➔ To strengthen R&D in new core business segment for core therapeutic areas
GlaxoSmithKline & GlycoVaxyn • Business Segment: Vaccines (new core) • Therapeutic Area: Vaccines (core) • Value Chain: R&D & Manufacturing	**OTC / Consumer Health acquires Innovator** ➔ To strengthen R&D in new core business segment for core therapeutic areas

Johnson & Johnson – Actelion • Business Segment: Pharmaceuticals (core) • Therapeutic Area: Pulmonary Arterial Hypertension (non-core) • Value Chain: (R&D), Marketing & Sales	**OTC / Consumer Health acquires Innovator/Franchise Market Leader** ➔ To expand core business segment for new therapeutic area
Takeda – Nycomed • Business Segment: Pharmaceuticals (new core) • Therapeutic Area: Various • Value Chain: Manufacturing and Marketing & Sales • Geography: Europe and Emerging Markets (non-core)	**OTC / Consumer Health acquires Manufacturing and Sales Expert** ➔ To optimise value chain and expand market reach of new core business segment for various therapeutic areas

10.5 Interviews with Target Company Representatives

10.5.1 Interview with Dr. Pablo Umaña, Representative of GlycArt

TRANSCRIPT OF INTERVIEW

Interview with Dr. Pablo Umaña

- Company Co-Founder, CSO of GlycArt Biotechnology GmbH (until 2005)
- Head of Research Roche Glycart AG, Roche Group
- Head Cancer Immunotherapy Discovery, RICZ, Roche Glycart AG

Interview Details:

Interviewer:	Francy Grubenmann, Student at ZHAW
Interview Partner:	Dr. Pablo Umaña
Date and Time of Interview:	Wednesday, 29th of April 2020, 11:30 – 12:45
Format, Place:	Video Conference, Switzerland
Language:	English

Interviewer: When did the idea to do an M&A come up and what made Roche stand out as a potential partner?

Pablo Umaña: From the very start of the company we thought that an M&A was one of the exit options. It was at that particular point in time, however, towards the very end of 2004 and beginning of 2005, when it was not ourselves planning for it to happen. It came really unexpected as a completely unsolicited offer from another company. It was a mid-size European pharma company, which at that point had a lot of cash and wanted to move into oncology, and they had a strategy of acquiring small companies for that. This company had as a consultant someone who had worked with us before and this person knew all about what we have, and what we had in our pipeline let's say, and then this person recommended them to acquire us. But we were not aware. So, one day a letter arrived to our board and all our investors with a very good unsolicited offer to acquire the company. And so, basically, the board decided to take this offer, but at the same time, we hired an investment bank to help us manage the process of a controlled auction. A series of big biotech and pharma companies were contacted and they were told that Glycart is now possibly going to be acquired. But that they now have a short

period of time to come and do an analysis, a due diligence, and if they wanted to, they could make a competitive offer. It was in that process that Roche was one of the companies which was contacted, and they came in and they did the due diligence and so on. And in the end, they made a better offer than the company which had originally approached us. Of course, we already knew Roche as we had an R&D collaboration with Roche. But the M&A process was completely independent of that. I'm jumping ahead with one of your questions, but of course that contact helped once the process was kicked off. Having already that interaction with Roche, and that some of the people involved in the M&A process were the same people that were involved in the collaboration helped to some extent. But that was not the reason why Roche decided at the end to participate in the M&A process. It was all kicked off by an unsolicited third-party offer.

Interviewer: And what made Roche stand out as a suitor? Of course, probably they made a very good offer anyway, but what made it stand out in terms of strategic fit?

Pablo Umaña: Glycart was at that time focused just on one platform technology, GlycoMAb, which was enhancing anti-cancer antibodies, or therapeutic antibodies in general, but mainly used for anti-cancer antibodies. And we had two main drug candidates. One was GA101, which is the anti-CD20 and which is now Gazyva, actually. And then we had another molecule for EGFR, another receptor for solid tumours, and that molecule we called GA201. Clearly Roche was and is the world leader in oncology and also the biggest, in a way, biopharmaceutical company in the world. And in particular in the area of CD20 antibodies, Roche was the world leader at that point. The only molecule really in the market for anti-CD20, the only anti-CD20 antibody, was Rituxan/Mabthera and this was from the Roche group. So, from all aspects, being the world leader in biopharma, being the world leader in oncology, and really being the only developer of an anti-CD20 antibody for the treatment of a lymphomas and leukaemia and maybe somewhat immune diseases. All those aspects made Roche the perfect fit.

Interviewer: And by that, Roche really could see the value of Glycart as well, right?

Pablo Umaña: That of course as well. I was just saying from our point of view, why we thought Roche would be a very good fit for Glycart. There was also their whole science-based culture and how much they invest in research. So that made it of course also very attractive. But even just strategically from the type of technology and the type of drug candidates and specifically for our main product, which was GA101, which was to become Gazyva, it was a great fit. We knew that developing it will require at the end very long and big trials comparing against the standard of cure, which at that point of time was, or still is in many indications, Mabthera,

which is a product by Roche. The perfect partner for that was actually Roche. Not only from their overall culture and their philosophy for R&D, but also, actually, from the specific product areas in which we were active in. And then, for Roche, it was for the same reasons. They were very interested in anti-cancer antibodies and in technologies to enhance these anti-cancer antibodies. And they themselves saw that of all the emerging second generation anti-CD20 antibody drug candidates at that time, some were already in the clinical stage and others were in the preclinical stage like Gazyva, of all of those they saw that GA101 was a quite promising one. Of course, it is still very risky because it was at the preclinical stage, but the data that we had at that moment already showed that it had quite good potential. So, from their point of view, Roche was the one who was leading and owning, in a way, the anti-CD20 antibody market. So, they thought this could be a next generation product that potentially could be better than their current product in the market, at least in some indications. So, for them it was also important to get in early.

Interviewer: Definitely, it does sound like the perfect strategic fit.

Pablo Umaña: But the curious thing, I would say, was that although we always thought that it would be great to partner eventually with Roche, we were not planning to do that at that particular time point. It was an external event which triggered the whole thing.

Interviewer: But for the positive in the end, I would say, right? Now you are a centre of excellence within Roche and doing so many great things.

Pablo Umaña: Absolutely, it couldn't have gone better, actually.

Interviewer: Maybe, if we go along with the questions, we will certainly talk later about this more in detail. But were there any other collaborations? And did you also generate some revenue from licencing or were you just focusing on R&D?

Pablo Umaña: We were focusing on R&D, but we had other research collaborations. The model that we had in the company was kind of that we had two main things. One was the technology per se and licensing that technology to partners so that they can use it to improve their anti-cancer antibodies. And we had a few, not many, but a few early stage preclinical research collaborations testing that technology with some partners to improve their antibodies. So, this was all preclinical. For example, one of these collaborations we actually had with Roche. And like this, we actually had a few others, but not many. And then the main thing was actually developing our own drug candidates that were also improved with the GlycoMab technology, like GA101. That was the main part. So, we had a dual model, a hybrid strategy.

Licensing to improve products from others, but also developing our own drug candidates. And therefore, besides the preclinical collaboration with Roche, we also had a few others. But, of course, at that stage, because those were really early preclinical-stage collaborations, the revenue streams we had from that was relatively small compared to the funds that were coming from our venture capital investors. The main funds for the company were really investments from venture capital firms, and there was a small funding coming from these research collaborations. But at that stage, it was still very early, so it never moved into clinical stage projects with bigger milestone. It was just early research milestones and they were not that huge, let's say.

Interviewer: So, is it correct to assume that you did not have very established manufacturing or marketing and sales units? Because you were still in a preclinical stage, right?

Pablo Umaña: Yes, we were preclinical. Actually, we did have, at that time, one clinical study. It was not a product of ours, it was more again a research collaboration with an academic group, the University of Oxford. They had originated an anti-cancer antibody many years ago for a certain type of leukaemia and they had licenced that antibody to a company in the US, but they had maintained some rights to still do some research. Together with them, we designed a very small clinical study to make a GlycoMab version of that antibody. And then, they would test it in a few patients, comparing the two antibodies. It basically was for a proof of concept of the technology per se. But that was still in a time when they had their own kind of GMP facility, but it was kind of very small within the University. And it was a collaboration with them at that stage, but we were not doing the manufacturing, they were doing it. But we were collaborating with them for that. And then, for our own product candidates like GA101 or GA201, we were collaborating on the manufacturing side of things with a contract manufacturing organisation, which was Lonza, actually. We were collaborating with them to make the production cell lines for that. And the very start of defining the production processes. So, that was still at very early stages. But for example, the production process for Gazyva is based on the original Lonza process. And the manufacturing cell line that is still used now for the market is the cell line that we made originally in Schlieren, using the Lonza technology for making the cell lines. And Roche adopted that and they optimised the process also. But it was originally based on the Lonza ones. So, we did do a little bit of the first GMP manufacturing steps, the very basis at that point. And then, the M&A with Roche happened, so they took that over. But the actual cell line and production cell was made in Glycart. So, that's for manufacturing. We had this collaboration with Lonza and already had worked on the early steps. And then for marketing,

we had a business development person, and that was basically it. But that person was mainly managing interactions with partners for research collaborations.

Interviewer: Okay, so, that means Glycart was mainly R&D-focused, had a collaboration with Lonza for early manufacturing and a business development person to manage R&D partnerships, correct?

Pablo Umaña: Exactly.

Interviewer: And then came the M&A with Roche and the integration management. So, when did the planning of the integration begin, because you said there was this auction process with the due diligence. Did you plan the whole integration project already before the deal was closed? And was everyone involved, and was there a clear vision from the beginning on?

Pablo Umaña: Yes. Towards the very end of the negotiation, when it was clear that the M&A was happening, then the integration became part of the discussions. How we would be integrated, but at a high level first. For example, we had agreed at the beginning on a trial period of two years to see how the whole thing would work, basically. And then how our research will be kept, what we will be working on in general, with whom we will be working, with which divisions in Roche we will be interacting. And that were just basically those terms. But that was also stipulated in the contract, in the acquisition agreement. Those bigger terms or conditions, they were already agreed upon in the contract. The actual fine details, then, happened once the acquisition contract was signed. But it happened very fast. It happened immediately and there was an integration task force, and with several people involved from Roche and several people from our side, coordinating all aspects really, from how to manage the whole human resources part, the financial controlling part, and the actual projects, of course. A big driver of the acquisition was GA101, so planning how to manage that project, and creating joint research teams between people in Roche and the people in Glycart. All that was triggered very fast and was very well planned in detail. We always had a very important role in that, as equal partners, I would say. So, the integration planning went quite well. And, of course, some of the people, just a few, but some of the people we already knew from before through the research collaboration that we had. And they were, as I said, involved in the due diligence and they were also involved in the integration task force. Another thing that was very important for me was that the head of R&D at Roche at that time, based in Basel, was also quite involved. And he was very keen on maintaining this kind of general model that Roche has for this type of acquisitions, namely to maintain diversity, let's say, even if the companies are very small like Glycart. So, to reach kind of an optimum between the local culture and independence, but still

very well coordinated with the central research, so that you have this coordination, but you don't completely kill the independence. Because otherwise, if you completely impose all the processes and culture and everything, then, of course, you have something probably very predictable. But you also just get more of the same. If you want to keep a little bit of diversity, you have to strike a balance there. And he was very keen on achieving that. So, from the beginning, he told me that I have a direct line to him. And whenever I have a concern or I feel that something is not going in the right way, to just call him. And that's what we did. When there was some confusion or some disagreement of how something was being done, I would directly call him and then he would help to resolve it.

Interviewer: That sounds like really good communication and collaboration.

Pablo Umaña: Absolutely. But it was clear for everyone, and really coming from the top in Roche that this should be the spirit of the collaboration and the integration. And I think it was very important that people also saw that. That the top level was very intent and that he was very keen on making sure that this would happen.

Interviewer: According to integration theories, it is really important for biotech start-ups to mainly focus on R&D and to be integrated in a way that preserves their culture and know-how as much as possible, which is, essentially, by giving them independence. But I would even argue, also now based on what you explained, that it's equally important to really work together and to get that collaboration going. Do you agree?

Pablo Umaña: Absolutely. I think you have to consider that each case may be different depending on how advanced and how developed that biotech company was. In our case, we were really in a very early stage. And as I said, we didn't really have clinical development expertise and we didn't have our own toxicology expertise. We only were doing that by collaborating with CROs or CMOs. We also didn't have our own manufacturing part. And the major driver for the collaboration was the drug candidates and transferring that technology, transferring the process and so on, but moving that very fast into clinical development. That, obviously, required a lot of interaction. It would be different if Glycart had been at a much more advanced stage and had all those functions already within itself. Then maybe Roche could have said, "OK, well, then we have like a committee or whatever, but you are running all that." But in this case, because of the stage of development that Glycart was in, that was not possible. To move the project fast into clinical trials, it required the people in Roche in those various functions. Manufacturing, toxicology, technical trials, that all had to come from Roche because we didn't have it in Glycart. But during those early phases, we needed still to transfer the

technology, the cell line, the analytics of how to check for the quality of the product, and then, all the research part, that was done completely jointly to still study preclinically the biology of the molecule. Because even at that stage, you are just learning how the molecule is really working and with what to combine it best, for example. So, you still need to do a lot of preclinical biological research. And there, we were still very active, and we remain very active today, in the preclinical biology for research on the molecule. We remain very active in the technology itself regarding, as I said, developing assays to monitor the quality of the product and these kinds of things. But always interacting with Roche. And then, there were things that Roche was completely in charge of, like the clinical development and so on. But the nice thing was that we were still involved. For example, myself and a few of my colleagues, we were part of the development team even though we had the expertise at that point on clinical development and so on. But they made us part of it so we could always have a kind of scientific discussion. And for some particular questions during the early clinical development, they needed to have insight into how the molecule was working. They were also always asking for our opinion. So, I think even that was done in a very nice and inclusive way, even in areas which were not really of our expertise.

Interviewer: It sounds like true team spirit. And it's really one team. Of course, at some point somebody's more responsible than the other, but it's still one effort behind everything, right?

Pablo Umaña: Exactly. All that was, of course, with the original products and the original technology. And that was ongoing. Then came the phase very shortly afterwards where Glycart's focus expanded. The technologies that Glycart had were of course GlycoMab, but also, we had some more expertise in protein engineering, for example, on how to humanise antibodies. And at that point Roche did not have that technology per se themselves in-house. They were getting that as a service from other companies. So, then we actually started providing that service also in a way for other projects within the Roche portfolio. And then, of course, there were other anti-cancer antibodies in Roche where they also wanted to test them in the GlycoMab version. We then started a phase where we were working with other project teams in Roche. There was a project team - let's say in Germany or even at that time Roche had a research centre in Palo Alto for example - and they had their own antibody that they were developing for a certain indication and they wanted that antibody to be engineered. So, we were helping in that effort as well. As a result, we became also integrated in the global R&D organisation in that respect. Not only with our own projects, but also participating in other projects for enhancing them. So, we had two types of expertise or areas of work, you could say. One was on antibody or protein engineering, independent of what the application of that protein

was. And the other area was our anti-cancer antibodies that we were developing together with Roche. And because of that, we were kind of integrated R&D-wise in a dual way. We had one connection, one foot let's say, in the therapeutic protein organisation of Roche. Today, it's the same organisation, but it has grown and evolved and is now called the large molecule research organisation. So, I always had a reporting line to the head of this organisation. And our teams were always participating in the global meetings and so on of this organisation. And we were doing a lot of projects then jointly.

Interviewer: And this was not exclusively focused on oncology, if I may ask?

Pablo Umaña: That was many times oncology, actually, because the majority of the portfolio is oncology. But sometimes, there were other indications, like neuroscience, inflammation, or infectious diseases, and so on. As long as it involved protein engineering, so things where we could contribute with some of our expertise that we had developed. That was one part. And then, the other part was oncology itself, the oncology R&D, because of the drug candidates that we had. So, I also was reporting directly to the head of research in oncology. We always had these dual reporting lines. And even today, almost 16 years later, we have maintained that. We are still part of both R&D organisations. We are still part of the large molecule protein engineering organisation and we are still part of the oncology R&D organisation. What changed quite early on, around 2007 or 2008, was that we ourselves saw that, okay, we were helping with those two projects that we had already in Glycart, the GA101 and the GA201, we were participating in the R&D by applying the GlycoMab technology to other anti-cancer antibodies from other researchers in Roche, and we were participating in applying some of our protein engineering expertise and know-how to other projects. That's what we were doing. But we felt that this was becoming maybe too limited. And it was a little bit risky to depend only on this GlycoMab technology, which was one way of engineering antibodies and one particular way to engage certain cells of the immune system to contribute to the anti-cancer attack. Let's say it's one therapeutic approach. So, we decided that we didn't want to be kind of like a one-trick-pony. And thus, we decided to still capitalise on our expertise, but broaden a little. We said, "let's developed other technologies, other protein engineering technologies, other ways to engineer antibodies," but also, "let's developed other type of drug candidates, still on cancer and still on engaging the immune system to attack cancer, but in a different way than GlycoMab does." Because there are many other types of immune cells that you can recruit to attack the tumour. And that's how we, already back in 2008, made a lot of proposals for projects, technology development, and new types of drug candidates. And I presented all these to the head of oncology research, to the heads of protein technologies or therapeutic protein research

and so on. And they were endorsed and then, we got the funding. And based on this plan - when we were still, in parallel, continuing to do the other things that I mentioned - we started developing all these new drug candidates and all these new platform technologies with the specific focus on how to better engage the immune system to attack cancer. And at that time the cancer immunotherapy field was just starting to emerge, but today, it is one of the hottest areas in the field. And it was through that kind of organic process that we, over time, over this period of 15 years, became then the centre of excellence for the Roche part of the organisation, pRED. So, we became the centre for cancer immunotherapy research. Because a lot of that is based on how to engage T-cells with special types of bispecific antibodies, which was one of the things that we started already back in 2008. Based on new generations of cytokines, which was also something that we started already that time. Something that we started a little bit later was using other types of immune modulating proteins. Basically, we have built a pipeline that has become quite large and has become the core of the immunotherapy pipeline from the pRED side. And based on that work, and because we were delivering and these things were moving forward, then we grew over that period of time from 29 people, which we were when we were acquired, to about 190 people today. And we had only our small building there before, on top of a car garage. And then, a little bit more than two years ago, Roche helped us to have our own building. So now, we have a building of 10 floors that is fully dedicated to us.

Interviewer: And how would you say did Roche support that process of expanding your research focus, expanding your technology, and your expertise? Was it easy to find support or did it take a lot of convincing?

Pablo Umaña: We had huge support and we still have huge support. But of course, you have to come up with good plans and you need to work very hard for it. You have to come up with unique ideas and you have to invest in doing the right experiments and generating the right patents. It is not that they will just do it because you're nice, let's say. You have to come up with good ideas and things that look promising. But they were really open to that. And as I said, everything that we have been doing – from the acquisition until today – are things that we have proposed. There has never been anything imposed on us. So, they never said, "okay now you have to work on this." Everything that we are doing is everything that we have proposed. And, of course, throughout the time, we needed to align and we needed to go through the normal governance steps for these projects. And in all these projects, even though they were generated from our group, we rely and depend on significant input from many other researchers in other parts of Roche. For example, all the GMP manufacturing, the process development, and the toxicology are done in other parts of Roche. It is a close collaboration. None of our projects are

done by Roche Glycart alone. They are all done as a collaboration with many other people in Roche. So, we are fully embedded. But in a way, this vision of having something that is a source of innovation, that has its own culture, and has its own certain level of independence - not complete independence, but some level independence – somehow has really turned out to work in practice. But it requires finding this optimum. Optimum of having good support, a lot of input, and a lot of collaboration, but at the same time leaving room for proposals coming from us.

Interviewer: Was it already an idea that Glycart should further expand and achieve this state as a centre of excellence from the start or was it something that developed?

Pablo Umaña: No, it was something that developed. As I said, in the very beginning it was just a two-year trial period. I mean, Roche made a significant investment in Glycart and they were mainly acquiring the technology and the products, the drug candidates. And as I said, the major driver was really the GA101. So, the first two years had a real focus on that and making sure this worked out and that the maximum potential of it will be realised. It was only during that time that they got to know us better, and we ourselves then also proposed and said, "look we can do this and we would like to do this." We came up with proposals and with ideas and convinced people. A lot of it had to come from us, but they were very open to that and very supportive and flexible. And as I said, at the high level, there was always this vision of making the most out of the collaboration. But the actual plans and so on, we had to drive it. But as I said, they were very receptive and very supportive.

Interviewer: And that trial period you mentioned, that was right after the acquisition, correct? During that period, did Glycart remain approximately the same as before, or was there already some integration happening at that time? For example, HR and IT were already being integrated, right?

Pablo Umaña: It was quite intense during that time, as I mentioned. These functions were managed locally in our site, so we had an IT person, an HR contact, and a finance person. They were from our team, but they were closely collaborating and on a daily basis in contact with their counterparts in Roche. And even the HR at the beginning, because at Glycart, we didn't have our own HR but had a company that was helping us with that service. And even during the first months of the integration, they still stayed as a bridge in making the transition to Roche. Of course, after a few months, there was eventually a complete transition to Roche HR.

Interviewer: So, the people in Glycart which were responsible for IT or finance remained? They basically became the local counterparts to the Roche functions?

Pablo Umaña: Exactly. Even today, our local head of finance, she still reports to me, but also has a double reporting line to someone in the Roche finance organisation.

Interviewer: So, it's a matrix approach?

Pablo Umaña: Exactly.

Interviewer: And in regard to the integration progress, where there any kind of hurdles that you had to overcome in the integration? And how was the reporting handled? Was there always clarity on the next steps, and the milestones? And was there transparency in how everything was handled?

Pablo Umaña: Yes. There was complete transparency and it was very well organised with reporting. It was all organised by projects, and there were global forums where things would be presented. And we had joined teams. There were governance bodies where reports were given to and so on. At the beginning especially - when you go into the nitty-gritty of things for individual projects and technical details and when there are joint teams – for some people, maybe, it was not clear, I would say, from the Roche side. And they felt, "this has to be done like this, this is how you should do it." And then, we had to solve those little glitches, but those were all, in the end, minor things. And as I said, the good thing for us was that we knew that we had the support at the high level and we could always then consult and get their back-up and they would always help us resolve those situations. So, there was nothing really major in that respect. What was quite demanding for me in a way was that, especially between 2007 and 2015, there were four overall huge changes in the whole R&D organisation of Roche. With a completely new head of R&D coming and reorganising everything. And each of those changes required a lot of effort from myself and from my team to again making sure that what we had established before - the ways of working, what was our mission, what was our contribution to the organisation, how was our relationship – that all of that was kept and if possible even improved and grown. There weren't the same people that were there from the very beginning anymore and we had to kind of re-establish some relationships. Four times we had to go through this whole reorganisation in Roche and that required quite an effort. The good thing was that we were in Schlieren and we were a unit there. But all the interfaces and, especially, making sure that our role and the projects we are working on and the funding and all that was maintained, that took some effort. Because every time there is such a big reorganisation, then

everything is a little bit questioned again. Do we need to do this this or that way and who is responsible for this or that? Should we put more money here or more money there? It is not an integration, but it takes also almost as much effort. If you believe in your mission, you want to make sure that this mission continues. And, of course, that they will also see it. And in the end, it was always good because they could see the value and were all very supportive. They saw the contributions we were making and it always worked well. But it required effort, it's not like that it happened automatically. Every time there is such a research reorganisation, it requires some alignment.

Interviewer: But you were really successful in overcoming these challenges, it seems. Was there ever a discussion of moving Glycart to Basel?

Pablo Umaña: There were, but they never even reached me. I was directly informed by my bosses in Roche after such a discussion took place, which they had once in a while in the leadership team in Basel. But those discussions stopped very quickly. Again, at the highest level, where they would say, "no this is not our model, we want to maintain the diversity and maintain this innovation and the different innovation spirits." So, those ideas were stopped very quickly and they never even reached me. I was told afterwards.

Interviewer: You really enjoyed strong support at the top level, and the leadership was really committed to your mission, then?

Pablo Umaña: Yes, absolutely.

Interviewer: Was there ever uncertainty in the beginning about what would happen, or did people always feel confident about their future at Roche? Especially considering this two-year trial period. Of course, there is always uncertainty in an integration, but if managed well this can be limited. How was it for Glycart?

Pablo Umaña: It think it was very well-managed. Of course, at the beginning, there was some uncertainty, and every time there was one of these R&D reorganisations, there was a little bit of uncertainty. But over time, less and less and less. I think it was always quite well-managed. And maybe just at the very beginning, because as I said we had this two-year trial period as per contract, so we had only temporary contracts for two years. During that time at the beginning, it was not quite clear. But very quickly, I think already after a year or so, it was getting much clearer that we were gonna stay there for the long-term.

Interviewer: The trial period was when exactly?

Pablo Umaña: Mid-2005 to Mid-2007.

Interviewer: And that was agreed upon at the beginning of the acquisition?

Pablo Umaña: Yes, it was in the contract already.

Interviewer: And the idea was to test out the waters, to see where the projects would go and then decide further?

Pablo Umaña: Exactly.

Interviewer: In terms of talent management, you already mentioned that there is generally a lot of collaboration, especially as Glycart became bigger and expanded. How was and is this knowledge exchange ensured, and are people free to maybe join different teams or to develop themselves professionally in other areas of Roche?

Pablo Umaña: Absolutely. For the projects, everyone is part of global teams and therefore they are interacting with people all over the world in Roche. Many times also through collaborations that we have with people in Chugai or in Genentech. And of course, we have projects that have moved into the later-stage organisation. So – after clinical proof of the concept when the projects moved into late phase two or phase three, or into the market like Gazyza – there is an interaction with people that are in the latest stage global organisation all over the world and with commercial and so on. And so, those interactions are given and people are quite connected. And sometimes people have moved away from Schlieren and have actually taken a job somewhere else in Roche, in Basel or Penzberg, for example.

Interviewer: Did people from other parts of Roche join Glycart as well?

Pablo Umaña: Absolutely, that as well. It's really both ways.

Interviewer: That is great and probably also helped in establishing this feeling of "togetherness," right?

Pablo Umaña: Exactly. And then, of course, also in our building, now we have people co-located from what we call other global pRED functions. They are not reporting to me, but they are located in Schlieren because they collaborate very closely with us, so it was important to be co-located. We have people, for example, that are from the clinical side, we have people that are on the clinical biomarkers or the actual clinical scientists and clinical leaders that are based in Roche Glycart and part of Roche Glycart. But their global reporting line is not with me, because they are in the clinical organisation. We also have people from the toxicology/safety

organisation that are also based in Schlieren and they report to someone in Basel, for example. We have people from the global informatics organisation which are also based in our building as they need to support our projects and facility, a lot of big data type of analysis and things like that. They are not reporting to me, but they are co-located. Of course, the majority of the people based in Roche Glycart, because it is an early R&D site, is under this cancer immunotherapy research with an oncology and protein engineering part. As of today, that is still the majority. And through a couple of layers, these people are reporting to me and then reporting from me into the global oncology and into the global large molecule research organisation. But, in addition to those, we also have a few people from other parts of the organisation which are co-located with us.

Interviewer: That, indeed, makes much sense because it's really important to have this inter-connectedness in a way, right?

Pablo Umaña: Absolutely.

Interviewer: In terms of cultural integration challenges, would you say that there was some kind of uncertainty towards Roche as a big pharma corporation, especially from your perspective as an entrepreneurial start-up. Or were there no challenges in that aspects?

Pablo Umaña: I think there was some uncertainty at the beginning, especially the first years. But as over time people started interacting a lot more in these global teams and as we saw that we could develop our ideas but at the same time collaborate, this uncertainty kind of all went away. It is nice because I can really say we kind of have both things at the same time. We have a local identity and the local biotech spirit, and people really appreciate the local culture and the ways we work and interact and so on. But at the same time, people really feel part of Roche and appreciate that and are proud of that. And so, it is really nice as we have the best of both worlds, actually.

Interviewer: That's great and definitely sounds also like a recipe for success. I think it's very important to preserve that biotech spirit, but also at the same time become one bigger unit, one team.

Pablo Umaña: Absolutely.

Interviewer: And how independent, would you say, are you in terms of research, especially considering decision authority with the projects you are working on.

Pablo Umaña: I would say the vast majority of what we are doing is really things that we have proposed. I mean, we do some things where we are supporting other projects that were proposed somewhere else. But the majority of what we're doing are things that we proposed. For those things eventually to move forward into the clinic, it requires a lot of funding and it requires a lot of input from people working in other parts of Roche. And therefore, for that to happen, those projects need to go through the normal governance and approvals. We need to demonstrate certain things and we need to present them. The project teams, they need to report on what is the result so far and what are the plans for the next stage, and how much money and people are needed to support the next phase. And this needs to be endorsed of course. In that sense, we are not independent, let's say. But we are independent in the sense that it is up to us to make that happen and to generate the idea and then the data and move the project forward. In collaboration, of course. So engaging people from many other parts of Roche. But in the end, it of course requires approval. That is for the projects. And then our normal functional costs, let's say the budget, so the salaries of the people, the costs for running the site, the rent, all that at the end has to be approved by people in pRED's central management.

Interviewer: You also talked about how the integration into Roche helped Glycart expand and how you had a lot of support from Roche for that. Do you think that through this transformation which Glycart went through, that you also transformed Roche in a way?

Pablo Umaña: I would like to think so, yes. Even little things at the beginning did a bit. The production processes for making the therapeutic proteins, for instance, we brought in from the collaboration with Lonza. In Roche, it was applied then for other projects as well. Roche, of course, was developing their own production platform, which is the one that is used today. But for some products, the Lonza one was used and in a way that was introduced because of the collaboration with Glycart. That is just a minor thing. But of course, the bigger thing is that if you look today, oncology is still the major area for Roche. And within the pRED part of the organisation, which is one third of the organisation, cancer immunotherapy has a major part of the oncology portfolio, and we are mainly responsible for that. If you look at, for example, the clinical pipeline today in pRED, a large proportion of that comes originally from projects that were started in Schlieren. So, I would like to say that from that point of view, of course Glycart has had a big impact in Roche. The whole cancer immunotherapy strategy is based on certain platforms on how to engage T-cells and how to stimulate certain immune cell, and these were things that have been developed out of ideas and efforts that we started in Glycart are already 10 years ago. And that's why we have kind of become de facto the cancer immunotherapy centre for the pRED part of the organisation.

Interviewer: So, you brought that expertise into Roche?

Pablo Umaña: Exactely. In that part, absolutely, yes. We have a big impact in Roche. I don't know if your question was more in regards to culture or so?

Interviewer: I mean, as you said in the beginning, Roche celebrates cultural diversity, so I think with every additional culture represented, the culture of Roche gets more diverse, right?

Pablo Umaña: Absolutely.

Interviewer: I was more thinking about what was the value that Roche gained from Glycart and what were the changes in strategy, business focus, or approaches resulting from the integration of Glycart?

Pablo Umaña: Well, as I said, the major part of the therapeutic portfolio today, of the clinical portfolio, is cancer immunotherapy. And a lot of the strategy and the drug candidates currently in the pipeline for cancer immunotherapy have been born out of this original effort from Glycart.

Interviewer: And what would you say is the value for customers from the acquisition?

Pablo Umaña: The value is that, as a company, we are generating many more options, new shots on goal, let's say. We have new differentiated drug candidates. Our role in society where we are now in the R&D is to bring meaningful new potential treatment options for patients in need. In particular in our case for cancer patients in need. And that's the great thing about being part of Roche in a way, because the philosophy is all about differentiation. It is all about no me-too products, they really need to have something significantly different, either from increased efficacy or a better therapeutic index that maintains the efficacy but is better tolerated and things like that. So, the molecules need to be differentiated and that can only come from new research ideas. And I think the collaboration between Glycart and Roche has really delivered on that.

Interviewer: And not only with your ideas, but also with your technologies and approaches, correct?

Pablo Umaña: Absolutely. It is both things. On the one side we have the ability for how to engineer antibodies to do a certain job better. That is a critical element, but it's not the driver. The driver is always the understanding of the disease biology, where we also invest a lot. Understanding how the immune system is recognising the cancer cells, how the immune system can attack that tumour, and so on. And based on that new understanding that we gather – of course by ourselves, but also in collaboration with others in Roche and in collaboration with

external world and academic partners - based on that understanding, we then make new therapeutic hypothesis of how we can make a medicine that better engages the immune system to attack cancer. And then, we take advantage of our protein engineering expertise to make that new type of medicine. But the driver is always the new biological understanding and a new therapeutic hypothesis, which is then enabled by the improved protein engineering.

Interviewer: So basically, first you have to understand it better and then develop something that can fight or treat it better, correct?

Pablo Umaña: Exactly.

Interviewer: That sounds really like a wonderful value proposition and I am truly looking forward to seeing what other medicines will originate from Glycart. Regarding Genetech, which was shortly fully acquired by Roche after the acquisition of Glycart, and you did have some kind of collaboration during that time concerning Gazyva, right? Do you think the acquisition of Glycart and thereby Gazyva influenced Roche in its decision to fully integrate Genetech?

Pablo Umaña: No, I don't think that was a driver at all. That was mainly driven by other strategic reasons. It is true that the in-licensing of Gazyva by Genentech happened prior to the full acquisition of Genetech. At that time, Genentech had a collaboration with Biogen Idec on a next generation product for CD-20 antibody. They were also working on a new one and in a way competing with Gazyva. But very early on, already in phase 1, they thought Gazyva was more promising. So, they stopped their project and both Genentech and Biogen Idec in-licensed Gazyva. Moreover, Chugai also in-licensed Gazyva. In the case of Genentech – nowadays Genentech does not in-license anything because it is fully part of Roche – but at that time it was not fully part of Roche, so Genentech had to in-license Gazyva. But that was in no way a driver of the full acquisition of Genetech.

Interviewer: Ah ok, so that just correlated in the timeline.

Pablo Umaña: Exactly.

Interviewer: Maybe in more general terms, do you think the acquisition by Roche accelerated the progress made at Glycart or did it slow it down?

Pablo Umaña: Absolutely accelerated it. For us, it was a huge catalyst. Because of the way in which it was done. And because we were allowed and given the space to develop and pursue our own ideas, but at the same time getting a lot of support from Roche. Not only financial support, but actual R&D support. We became part of a joint team that was helping to move

forward ideas that we had proposed. So, it has been a huge catalyst. Being part of Roche has allowed us to grow tremendously and to pursue new ideas. We have a completely different focus today. I mean, we have the same focus in the sense that we are still doing antibody engineering and we are still working on how to engage the immune system on how to attack cancer. That was the focus of Glycart from the beginning, antibody engineering and engaging the immune system to attack cancer. But the kind of things that we are doing today – the type of antibody engineering and the type of ways in which we engage the immune system – are completely different.

Interviewer: I was just asking because in some integration cases, it happens that it shifts the focus away from important things or complicates certain matters, and as a result, the progress slows down. But if done right, it's the opposite, do you agree?

Pablo Umaña: Absolutely. And as I said, most things we are doing locally is under our control. That is also why it is important to maintain this kind of duality. Because all those things of how we do the initial part of our research, how we do our experiments, and coordinate those things, and prioritise certain things over others. All that still is done completely by us and in a way in which we think is best. So that's how things are not slowed down. It is not that if we need to make a new protein or to test something in a new assay or so, we have to ask permission from someone.

Interviewer: So, you really got that support and that autonomy to make that process effective?

Pablo Umaña: Yes, absolutely.

Interviewer: Finally, what would you say is the most important thing when integrating a biotech company, especially for big pharma? What was the lesson learned, basically?

Pablo Umaña: I think, it's really having a lot of transparency and from the beginning making sure to have alignment at the higher level with people that are really at the top of the R&D on what the vision is for the collaboration. An early aligning on that, and making sure that this is maintained. And really – because if you don't want to have more of the same – having that sense of how we can organise things in a way that is truly synergistic. And not in the end making an amalgam that is just making more of the same. Having a lot of clarity from the beginning on that and aligning in the higher levels of management on that vision.

10.5.2 Interview with Dr. Dominik Escher, Representative of ESBATech

TRANSCRIPT OF INTERVIEW

Interview with Dr. Dominik Escher

- Company Co-Founder, CEO of ESBATech AG (until 2009)
- Head of ESBATech, an Alcon Biomedical Research Unit LLC (until 2011)
- Head of ESBATech, a Novartis Company LLC (until 2016)
- Partner at Pureos Bioventures
- Executive Chairman of CDR-Life Inc.
- President of Swiss Biotech Association

Interview Details:

Interviewer:	Francy Grubenmann, Student at ZHAW
Interview Partner:	Dr. Dominik Escher
Date and Time of Interview:	Tuesday, 21st of April 2020, 9:00 – 10:00
Format, Place:	Telephone Call, Switzerland
Language:	English

Interviewer: What was the situation of ESBATech before the acquisition? Was Beovu already in the development pipeline? I also read that ESBATech had a collaboration with Roche. Where there any others and how did ESBATech generate revenues?

Dominik Escher: With Roche, it was a very early collaboration on target gene validation. It was a time when all these genes, because the human genome sequencing was completed, were all of a sudden available and nobody really knew the function behind them. So, when we started in 1998 with ESBATech, there was the business plan to establish ourselves in the field of target gene validation. We were using yeast, which is a cellular system which we did a research on at the university. The concept was that we sort of take human diseases and put that into yeast, and then start to understand at the molecular level how the disease works, and more importantly, trying to cure the disease at the molecular level. And that was the topic of the Roche collaboration. There was a gene in Alzheimer's disease where the function was not yet completely clear and we provided a research plan to them to elucidate the function of that gene.

And that research collaboration was anticipated over two years which we completed, and everything was fine. We could sort of identify the function of that gene in Alzheimer's disease. But that was at the very early beginning and I think we started in 1999 and that was terminated or completed in 2001.

Interviewer: Were there any later collaborations?

Dominik Escher: No, we had none. Actually, it was a little bit on purpose because we decided to go through the classical venture capital financing round. And we had then, in the end, back in 2009, we had 90 million of venture capital in the company. We did the first financing round two weeks after 9/11, which had everybody turn crazy and the deal almost broke apart of course. It was especially the bankers, the world was mad, probably even madder than today with the coronavirus crisis. But that was the first financing round where we had mainly three Swiss banks, Lombard Odier as the lead investor, Credit Suisse, and Banca della Svizzera Italiana. And shortly thereafter, the tech bubble burst, where the market crashed dramatically. And all the Swiss banks had to step out of venture capital because they considered this class of investment as much too risky for them. So, we lost all of our investors, which was not an easy task then to do the second financing round. But back in 2006. Because the first question, if you go to any investor for a second round is, how much is coming from the old investors and who is taking the lead from the old investors. There, I had to say, well, we lost basically all our old investors and we will not get money from our old investors. It was a difficult task and we on purpose went out to the US to attract US VCs and we were lucky to find Clarus Ventures and SV Life Sciences, two strong US life science-specialised venture capitalists. And then, I took the lead and by that I could then fill up.

Interviewer: So then concerning revenue streams before the acquisition?

Dominik Escher: Yes, that was zero.

Interviewer: But you did have this great technology that had proven successful and you had some attractive drug candidates in the pipeline? Was Beovu already in R&D at that point?

Dominik Escher: Yes, the second most advanced program was Beovu. We started that program back in 2006.

Interviewer: And then came the acquisition by Alcon, which seemed like a perfect strategic fit, correct?

Dominik Escher: So, the acquisition was driven by our financial need. As I mentioned before, we had 90 million venture capital in the company, which was for that time, at least for a Swiss biotech company, quite a sizable amount. And we had three programs in the clinic. And as soon as you start clinical development, the costs are again dramatically increasing. So, we probably would have had a financing need of another 100 million in order to advance our programs. We would have been at that time perfectly IPO ready. But you might recall that again in 2008/2009, there was a financial crisis and there were, I think, globally hardly any biotech IPOs. So, it was for us just possible to go through the M&A route, which was never my preferred scenario. If I was right in our business plans scenario 1, an IPO and to further build the company was always my preferred scenario. But you know, "bad timing" of course. So, we went through the acquisition route and we approached all the players in the field. We, on purpose, only wanted to do a trade sale with a franchise deal. The company, at that time, had three clinical programs. Two were in eye diseases, so in ophthalmology, and one was outside of ophthalmology. But we said that the ideal case would be to sell the ophthalmic part and to retain the rights outside of ophthalmology for a new company in order to further advance that company.

Interviewer: And the new company was Delenex, right?

Dominik Escher: Exactly. That was the spin-out of all non-ophthalmic assets into Delenex, which we then sold in summer 2016 to Cell Medica. And with the Alcon acquisition, we really went shopping, of course, and had quite some interest from a number of companies. But as you mentioned before, we also felt that with Alcon we had the best strategic fit. And Alcon was at that time the leader in eye diseases, globally, very recognised in that space. But they had no biologics. And we were developing so-called antibody fragments which are biologics and they had to move into that field because it was a huge growing field in eye diseases.

Interviewer: Okay, perfect. Then, I would like to ask you some questions regarding the integration phase, and if possible, always cover both the integration into Alcon as well as the one into Novartis for each topic. So, the first question is, when did the integration planning with Alcon start and were all parties involved in that?

Dominik Escher: With Alcon, then, it was a process which went, I think a little bit more than one year and, of course, we were fully involved in all the integration parts. So, from our side, actually, we made a proposal on how to integrate into Alcon. Of course, we started to get to know the Alcon company in much more detail during the due diligence. You meet all the people, you talk to all the scientists and to all the executive leadership, and you see how Alcon operates. And, of course, they also started to understand, then, how we operate and what we

can bring into the deal. And from that point of view we started to write a business plan for post-integration into Alcon where we had a steady growth over the next coming years in conjunction with quite a sizable investment from Alcon into ESBATech to fully automate some part of the research programs. And that whole plan, including integration, who will be part of the leadership, all that stuff, that was in place before we signed the agreement with Alcon.

Interviewer: So, before the acquisition was closed?

Dominik Escher: Exactly. It was really going integral during the negotiations, we started to write this business plan and the integration plan. It was very structured and very well organised, from both sides. And very committed from Alcon because, of course, they wanted to acquire us. And I think they also paid a reasonable price for that. For them, it was one of the larger acquisitions they have done in their history, so from that point of view, we really had the full attention from all the management levels.

Interviewer: Then, what about Novartis, were you also equally involved in the integration into Novartis?

Dominik Escher: We were actually driving the whole integration and from Novartis, there was much less reaction. It was the complete acquisition of Alcon, you know. And, of course, they realised that within Alcon, there is also a legal entity called ESBATech in Zurich, which at that time roughly had 85 people, so, relatively small compared to the whole Alcon group. But the overall research and development was roughly 120 people at Alcon in Fort Worth. And as I mentioned, roughly 80 to 90 people at ESBATech in Zurich. So, it was a little bit more that 200 people in the R&D sector. And within Novartis, R&D is conducted in the division called Novartis Institute of Biomedical Research. The NIBR division. That's the only division which does not generate any revenues, but is just responsible for discovery and early research up to clinical proof of concept. And at that time, there were roughly 30 people in Cambridge focusing on eye diseases. So overall it [Alcon + Novartis] was an R&D organisation of 230 to 250 people, depending on how you calculate it with the associates. And it was the largest research organisation globally just focusing on eye diseases at the time of acquisition. So, given that size, of course, that brought some interest also from Novartis. But for the integration into NIBR, that was then a process where the head of NIBR ophthalmology was involved as well as all the heads of Alcon and ESBATech. And we sort of designed an organisation where all the different parts were continuing to do research and were sort of equally distributed. That was the integration into NIBR, but since we were located in Switzerland, ESBATech, from a legal point of view, was integrated into Novartis Pharma Switzerland. And still being a legal entity, I was

also part of the executive management of Novartis Switzerland. But that integration was completely driven by us, so we made proposals on what has to be done. Then, of course, they had some requirements on IT solutions, financing, all that stuff, you know, the SG&A aspect and that was basically just taken over then from Novartis.

Interviewer: And the integration planning happened already before the completion of the takeover of Alcon by Novartis or afterwards?

Dominik Escher: No, it was after the closing.

Interviewer: And Novartis already had a majority shareholding in Alcon before the acquisition and then decided to fully acquire it, correct?

Dominik Escher: That's correct. At the first possible time, they had the option to fully acquire Alcon, and Novartis triggered on that. At the first option they were able to do this.

Interviewer: But the actual planning of the integration, especially of R&D, was then done post-acquisition?

Dominik Escher: Yes, exactly.

Interviewer: How about the integration management in regard to integration leadership and integration office. Were responsibilities clearly assigned during the whole process?

Dominik Escher: With Alcon yes, with Novartis no. And as I mentioned before, we were driving that because we felt as sort of being in the vacuum. Especially with the requirements for reporting within Novartis and all the requirements for financial reporting, IT systems, all that stuff. And we had to proactively approach Novartis hundreds of times probably to navigate our ways through the integration.

Interviewer: So, there was a lot of uncertainty in that phase?

Dominik Escher: Yes, totally.

Interviewer: But with Alcon, it was clear? Did you have a dedicated team for the integration?

Dominik Escher: Yes, exactly.

Interviewer: And with Alcon, the integration team was representative of both companies involved, and with Novartis it was more of a struggle, correct?

Dominik Escher: With Novartis it was a complete freestyle. To give you an example on the commitment: When we did the Alcon integration, the whole executive leadership team from

Alcon located in Fort Worth flew over to Zurich to welcome all of the employees. We had a townhall meeting, where they were presenting and welcoming us. Basically, like good parents when the kids come home, they are there and say hello to the kids. With Novartis, it took almost two years after the acquisition until Joseph Jimenez as CEO came over to Zurich. And he started to recognise what kind of value we bring to Novartis as we achieved quite a number of clinical proof of concepts with our programs. But, for instance, the president of NIBR, Mark Fishman at that time, he never visited us in Zurich. And I think that is just an extremely poor behaviour and poor leadership from my point of view.

Interviewer: I would agree. And it doesn't really promote commitment or confidence among the ESBATech employees.

Dominik Escher: That's right.

Interviewer: Moving on to my next question, how was progress monitoring and communication handled? Was there a lot of transparency with Alcon?

Dominik Escher: Yes, as I mentioned, we really had this business plan, which had several stages of the integration. And we always monitored the progress on this integration plan. And that was perfectly done. Also, the whole growth afterwards within Alcon, as I mentioned, all these automations and optimisation of research parts. That was perfectly done and a huge investment from Alcon. And they, of course, were extremely interested in that we advance our pipeline as fast and as good as possible. And that worked perfectly well.

Interviewer: And with Novartis, there wasn't much monitoring or communication?

Dominik Escher: There was zero monitoring.

Interviewer: Do you think that has anything to do with Novartis' size or because ESBATech was not individually acquired, but as a part of Alcon?

Dominik Escher: Good question. Novartis has done a couple of acquisitions and I think they probably learned from how poorly the Alcon acquisition was done. Because that was sometimes also a topic in the leadership or executive team meetings. And we could give an example of how we did the integration into Alcon. And so, Novartis probably learned a little bit on the mistakes they made. But such integrations are always really difficult, except if you are extremely motivated, as Alcon was, then you spend time, money, and energy on that. But with Novartis, I think many people did not really want to have Alcon at Novartis. So, it was really a decision which was driven by Daniel Vasella at that time. And the executive leadership

basically just had to say yes to that and then, of course, it was pushed down into all the different divisions and functions, and people were not convinced about that acquisition and, of course, then you already start to fight against quite some pushbacks from different people.

Interviewer: How were cultural differences handled as there was assumingly quite a difference in corporate cultures between ESBATech, Alcon, and Novartis?

Dominik Escher: The cultural difference to Alcon was quite dramatic, I would say. There was an old organisation located in Texas, which has a different mindset than people here in central Europe. Very much sales- and marketing-driven and a relatively small research unit which was unsuccessful in the pharma business to generate any innovation over years, almost decades. And from that point, the cultural difference was dramatic. But the good thing was that Alcon really left us in complete freedom and actually even the CEO mentioned, when he came to this townhall in Zurich to welcome us, that he wants to maintain the ESBATech spirit because that's why they acquired us at that time. Because they were fascinated at how we were working on the innovation and, of course, you do not want to disrupt that. And so, we had full freedom to operate. I think we had a very privileged position also in the leadership team. Some people really had hard times to push the programs through, and all our programs were approved and went through the pipeline extremely smoothly. From that point of view, this was pretty good. At Novartis, it was then completely different because Novartis had all these requirements to adapt to all their systems, whether it made sense or not. Moreover, Novartis has a culture, if we look at their past acquisitions, to really completely integrate and make everything flat. That's their policy. Roche, for example, has a completely different philosophy in that. They leave, just as Alcon did, all these companies at arms-length, give them freedom and certain autonomy. But Novartis was the complete opposite.

Interviewer: So, with Novartis, there was a great degree of integration which did not really resonate with the people?

Dominik Escher: Yes, that's in part the consequence. We had also a much-increased turnover. As a biotech and even within Alcon, the turnover was extremely low and people really stayed with the company in the difficult times before the acquisition. But then, at Novartis, that's an easy measure then, the turnover started to increase and that's always a sign that something is not working very well.

Interviewer: This leads me to my next question. How was talent management done in terms of personnel exchange or development opportunities?

Dominik Escher: With Alcon, since we were then much more in clinical development, we actually requested that somebody from the clinical department of Alcon came over to Zurich. This was a person who then did a two-year sabbatical with us, which is a big commitment. He had, or has, a family in Fort Worth but decided to spend two years in Zurich and commuting every quarter back to visit. But I think it was very good to have a person here in Zurich who knew all the systems and the culture for clinical development at Alcon. And we were using these resources of course. We had a relatively small clinical team of roughly eight people at that time. But when you start more clinical trials, then, of course, you have to expand on the headcount quite dramatically. And we could use the resources of Alcon, which I think was a great synergy. And with this link we had optimal communication between the two units.

Interviewer: Do you think this link also supported the information exchange between ESBATech and Alcon?

Dominik Escher: Certainly that and also, of course, through me. I was part of the global R&D leadership team at Alcon and we had weekly meetings and video conferences. I visited Fort Worth once a month. And, of course, we had to make sure that communication flows well.

Interviewer: And how was the talent management and exchange with Novartis handled?

Dominik Escher: In this aspect, I have to say that Novartis is really doing a good job. They have a system where they allow people to explore new sides within Novartis and we had three people at least who spent three to six months over in Boston, working in another research group, not only in ophthalmology, but also in other groups at Novartis. There, Novartis is extremely open within the company that people can explore new possibilities and that you have the possibility to see new functions or roles. Also, for development. That's a really good aspect of Novartis.

Interviewer: Certainly, and it probably also facilitated knowledge sharing?

Dominik Escher: Yes, absolutely.

Interviewer: What about the integration of functions such as Marketing and Sales as well as supporting functions?

Dominik Escher: In regards to IT, we took over the Novartis IT system. For HR, we had our own function at ESBATech. In that aspect, it was important to me to have a certain independence. Sales and Marketing is of course not really a topic if you still focus on R&D, so there was no integration and NIBR also had and still has nothing to do with sales and marketing.

Interviewer: How were responsibilities in terms of drug discovery and development as well as commercialisation handled? Did ESBATech handle the R&D up until clinical proof of concept and then the sales and marketing departments of Novartis took over?

Dominik Escher: Yes, that was also the concept that we had agreed upon with Alcon. ESBATech was responsible from beginning of the research, the discovery phase as it is called, up to clinical proof of concept, which is normally the so-called clinical trial phase 2a. This is where you for the first time show that the drug is working in patients. And then afterwards, it really gets into a completely different world where we had no experience and you need much more people for expanding on the clinical side. For Beovu, the phase 2b was done by Alcon and then Novartis took over and did the phase 3. Interestingly, this was the same structure that also NIBR has within Novartis. NIBR is also, within Novartis, responsible from discovery up to clinical proof of concept. There, we were fully aligned.

Interviewer: In terms of value creation, where do you think was the biggest synergy potential with Alcon and Novartis?

Dominik Escher: With Alcon, the synergy was that Alcon had three divisions, which were pharma, vision care, and surgical. And in lenses and surgical, they were still very innovative and were really leading the field. Whereas in the pharma sector, which, from a financial point of view, was the most important one for Alcon, they completely lacked innovation. They didn't bring a new drug to the market for about 15 or 16 years before our integration. So, all that they did was repurposing old drugs into eye drops and selling that as their medicines. But no innovation.

Interviewer: And then, ESBATech supported innovation by bringing in their technology and expertise?

Dominik Escher: Exactly.

Interviewer: How about with Novartis?

Dominik Escher: With Novartis, the situation was different because Novartis has some, or claims to have some, expertise with biologics. Which, however, if you look at what they really develop internally, is still extremely poor from my point of view. And we were actually contributing 18% of all the biological proof of concepts at the complete Novartis life from ESBATech. Which was with 90 people at that time, and comparing to more than 6,000 at NIBR doing just research and development, quite sizable. And that was the reason that also drove the attention of the key management to Zurich. They started to recognise that this small unit in

Zurich is doing quite well. This is always a big event in any company if you can, for the first time, show that your drug works with patients. And, of course, also Novartis is celebrating that. And Novartis has to deliver roughly 10 proof of concepts every year and, as I mentioned, we had four proof of concepts with biologics and if you just look at the biological proof of concepts, they were much less compared to the so-called small molecule drugs. Which are the classical pharma drugs. And there we contributed 18% of all biologics of the complete Novartis pipeline since its inception.

Interviewer: That is indeed a great achievement, especially when comparing the team size. And you had this unique technology which you used for your research?

Dominik Escher: Yes. These are so-called single chain antibody fragments, which are the smallest functional unit of an antibody which still can bind to the target. And that small protein has quite some advantages because it is very small and can penetrate much better into the tissue. And, of course, if you are in the eye, the back of the eye is full of nerve cells which is extremely dense tissue. This means if you have a large molecule or a large protein, that can hardly penetrate into that tissue, whereas if you have a small one, that can easily penetrate. And we were always focusing on these single chain antibody fragments. Actually, the first patent of this single chain was described in 1988, which means more than thirty years ago. So far, not a single single-chain antibody fragment came to the market. They all failed in clinical development. Beovu is now the first single-chain antibody fragment which comes to the market and is opening up a new product class. With this technology, we have taken a completely different spin compared to what the field was doing.

Interviewer: Was the technology only applied by ESBATech after the acquisition and integration or did it also find applications in other research departments?

Dominik Escher: No, since Alcon only acquired the ophthalmic rights, both Alcon and later on Novartis were limited to its application in ophthalmology. And these programs were fully run by ESBATech, of course.

Interviewer: And do you think, because you brought this whole expertise in biotechnology to Alcon, correct? Do you think that gave way to some transformative change within Alcon?

Dominik Escher: Yes. And if Novartis would have not acquired Alcon, with Beovu, Alcon would now probably again be number one also in the pharma part. That was always the rationale of the management, to strengthen the pharma pipeline of Alcon. And through the integration or, better, the two integrations, we lost at least two years in developing. So instead of last year,

Beovu could have been on the market in 2017. And by that, I think Alcon would have fully achieved the goal of the acquisition. But then, of course, it came different since Alcon was fully acquired by Novartis.

Interviewer: And what about Novartis? Do you think there was any kind of transformation within Novartis that came through the integration of ESBATech?

Dominik Escher: No, not at all. They always claim that they can do everything themselves. But if you look closely, every single biologic that Novartis is in late-development with is not coming from Novartis. They were not even capable of generating a simple antibody, which every PhD student can do. And they had to collaborate with Morphosis to generate antibodies. So, from my point of you, it was an extremely poor performance by Novartis.

Interviewer: So, the greatest benefit came with the integration of ESBATech into Alcon?

Dominik Escher: Yes.

Interviewer: We also always have to think about customers in the end and how they can benefit from these collaborations and M&As. Do you think with Beovu and the progress done at ESBATech, would this have happened without the acquisition, given that financing would have been available?

Dominik Escher: Yes, sure. That was always the plan.

Interviewer: Do you think the integration helped in accelerating the drug development? Or do you think there would have been the same or better progress on Beovu without the acquisitions.

Dominik Escher: Yes, it would have definitely been faster and earlier. If we had been able to do an IPO and to raise 150 to 200 million, which is doable with a good IPO and a good program behind, then I think we would have been faster. We would not have developed it in that indication which it is now on the market for, but in a smaller indication as it would have been faster and cheaper. But then, you can always expand from an existing indication into larger indications. This would have been the strategy that we would have followed on our own.

Interviewer: Do you think that the platform of Alcon and Novartis helped in the clinical development and marketing aspect?

Dominik Escher: Of course, that certainly helps. But it is probably a bit special in ophthalmology if you have a product which scientifically is better than anything else out there. Ophthalmologists and, in particular, retinal specialists are very scientific-driven people. And

basically, you have two main congresses in the United States and two main congresses here in Europe. And if you present this data at the scientific congress, ophthalmologists are jumping on your product. You don't actually need a big marketing division. Interestingly, the first product which came to the market for this indication was Lucentis from Genentech, which was actually also the first biologics which came in ophthalmology. This was a product which was approved in 2006. They had a handful of marketing guys at Genentech and that product immediately reached blockbuster potential. Just driven by the science and the efficacy they had shown, people jumped on it. That was always a sign to me that you probably don't need 3,000 marketing guys out there like big pharma has. But if you can really position your product smartly and in a good indication and show that it is superior to everything out there, then it goes by its own, basically.

Interviewer: May I ask if ESBATech also took on new projects from Alcon or Novartis?

Dominik Escher: No, we always actually developed our own products.

Interviewer: And does the technology for ophthalmologic application still remain with Novartis?

Dominik Escher: Yes. Also, ESBATech as a legal entity remained and is still present. It was closing in Schlieren, but this was a typical pharma decision. They had to cut the budget at NIBR because, as I mentioned, with more than 6,000 people, they also have to lay-off some employees. And they are quite under pressure because now, comparing to the outcome, it's really poor what they perform. So, they had to cut the budget. They closed down Shanghai, a UK site, a California site, and Zurich. And in the case of Zurich, they were under the impression that they just can move the majority of the people to Basel, where they of course had laboratories available. And I had a call with the president of NIBR before they announced it and he wanted to get my advice on how to best approach this. He's an American guy and I just said, in Switzerland, the commuting is different to the US. And the flexibility is also different. It the end, there were a handful of people which moved to Basel and as of today, I think there are two people left in Basel. It was a complete destruction of all the know-how, which they were not anticipating at that range. But, on the other hand, it was an opportunity. There were a number of new companies started by former ESBATech employees and from that point of view, it went well.

Interviewer: So, Novartis did not intend or anticipate the loss of ESBATech employees, they thought they could relocate them?

Dominik Escher: Yes.

Interviewer: And then with the announcement of the relocation came the employee turnover?

Dominik Escher: That's correct. I left Novartis at the beginning of 2016 and I felt we are very well embedded within Novartis. As I said, we delivered a number of proof of concepts. For me, it was a big surprise when this guy called me and said we would shut down Zurich.

Interviewer: So, you left before the announcement?

Dominik Escher: Yes. I would have fought against that and I made a recommendation to him that ESBATech could be used as a unit which has special expertise for so-called difficult proteins or non-alternative protein formats. And he felt it is a very good idea, but obviously the board had already decided. I think the head of ESBATech was certainly involved much earlier, so I think there would have been a possibility to fight against it. That was a missed opportunity. But as I said, in the end, I think it was good for new opportunities outside of Novartis.

Interviewer: And ESBATech still remains as a legal entity with two employees?

Dominik Escher: Yes, I assume there are probably also some tax reasons why the legal entity is still embedded within Novartis Pharma.

Interviewer: And there are still two former ESBATech employees working with the technology?

Dominik Escher: I think there are more people now working with the technology and I assume they have more programs in ophthalmology using single-chain antibody fragments. But of course, that information is confidential, so I do not know on what programs they are working on now.

Interviewer: On a more general subject, what do you think the position of Swiss biotech start-ups will be in the future and where do you see the collaboration between big pharma and Swiss biotech?

Dominik Escher: I think Switzerland has an extremely good ecosystem for biotech companies, starting from the science, which means we have excellent academic institutions in Switzerland at multiple locations. We have large pharma companies where people at one time might get a little bit tired and start to have ideas about founding their own companies. Then, we have excellent hospitals for clinical trials. All what is missing here is sufficient financing, which we are trying to take care a bit with Pureos Bioventures. So I think there is a great ecosystem and

we have more than 300 biotech companies doing R&D, mostly small- to mid-sized companies, and there are more than 1,500 people in these biotechs employed. And from that point of view, it's a really good ecosystem. On the other hand, the pharma model in my opinion is developing more and more into the direction where pharma is more concentrated on sales and marketing, and less on own research. And trying to in-license, or acquire, or collaborate on programs with biotechs early on and by that have a foot in that program. And as soon as it gets into larger clinical trials, then pharma takes over. And if you look at all the FDA approvals over the last years, I think now above 75% of all the FDA approvals are coming from small- to mid-sized biotechs, which really shows the business model is going in the direction that biotechs are the innovation engine and the large pharma companies are then excellent at large clinical trials, sales and marketing.

Interviewer: The R&D model is certainly changing. Do you think, in the next ten to twenty years, the M&A trend will continue or will there be a shift towards open innovation and collaboration?

Dominik Escher: I think the M&A trend will probably even increase since pharma is sitting on a lot of cash and the companies are desperate to innovate on their pipeline. And that's the driver behind the trend. They have to come up with new innovative treatments and better efficacy. And that's only done through innovation and they cannot provide these innovations through internal research. That's just impossible.

Interviewer: As a final question, what do you think is the most important factor which has to be considered when integrating a biotech company, especially for big pharma or larger pharmaceutical companies?

Dominik Escher: I would follow the Roche model. And other companies are doing this as well. They acquire companies and run them as independent units. But, of course, you need a good communication strategy through the leadership team. Keep the spirit, keep the people, and keep the innovation. And I think that is in my view the key to success. If you make everything flat and integrate completely, as in the case of Novartis, I think that never goes well. You lose the people, the innovation, and the culture.

10.5.3 Interview with Dr. Alcide Barberis, Representative of ESBATech

TRANSCRIPT OF INTERVIEW

Interview with Dr. Alcide Barberis

- Company Co-Founder, CSO of ESBATech AG (until 2006)
- Company Co-Founder, CSO/CEO of Oncalis AG (until 2008)
- President & Owner LCID Consulting LLC
- CEO of Mabylon AG

Interview Details:

Interviewer:	Francy Grubenmann, Student at ZHAW
Interview Partner:	Dr. Alcide Barberis
Date and Time of Interview:	Thursday, 16th of April 2020, 13:30 – 14:00
Format, Place:	Telephone Call, Switzerland
Language:	English

Interviewer: When and how did the idea for entering into an M&A emerge for ESBATech?

Alcide Barberis: When you found a company, any company not only a biotech company, then you want the company to succeed. And it depends really on what type of company you have. If you found a high-tech company, a biotech company, then of course the chance of getting into partnerships or an M&A becomes an option, a possibility. Especially in the biotech business, to become a fully integrated company, you need a lot of money and a lot of expertise from preclinical to clinical to marketing, financing, and so on. And, of course, you can build that, but you need a lot of money to do it. And that's not easy to get, at least at the early stage of a company. It's not that we decided at any time early to go absolutely for an M&A or for an IPO or to go forever forward until we would be on the market on our own. We didn't decide that, we just worked in parallel on a number of options. And since you need a lot of money, especially as a biotech company, you're always looking for potential investors and partnerships. We saw that our compound had technical advantages, biophysical advantages, biological advantages, which could be applied particularly for topical and local delivery. We had started to work on eye disease inflammations, with animals first. And already at that time, we made contact with

companies that were potentially interested in these activities and in this area. And then, we grasped the opportunity. Of course, it was a discussion, especially among the investors, whether we should sell to Alcon or not. It's not that Alcon came and we sold. It was one of the ten to twelve companies with which we were in contact. But Alcon was a US-specialised eye care company with a lot of medtech and traditional chemistry drugs on the market, so a successful company, but they didn't have any biologics. And for internal strategic reasons, Alcon decided to enter the biological field and we happened to be there with a product that had positive results and with efficient technology. And that's why they said they were interested. Of course, we discussed internally and particularly the investors who owned a great majority of the shares, and finally, it was decided to go down that avenue. It could have been that the shareholders and investors decided not to do it and invest another 100 million instead and go all the way to phase 2b and enter phase 3 and go for an IPO. But this is not something you can plan years in advance. You have to keep all the options and opportunities open, that's the nature of the business. And I believe that in other tech or high-tech companies, it is fairly the same. It really depends on how quick and how expensive it is to go to the marked with your own product. In a biotech company, it is very difficult. As you know, Mabylon, for instance, is a very early company at the research level. But what we do is already looking for potential interest, for companies that are interested and might like our programs, looking for matching technologies. We are doing that and at the present time we cannot say we want to absolutely go for an IPO or to sell the company or so. We say let's move forward with the R&D products, let's get good and convincing results, let's show that our technology and our platform and our products are of really high value. You have to show that and, step by step, look for potential interest, raise awareness. You just have to catch the opportunities. Carpe diem, so to say.

Interviewer: And why not licensing? Was that an option for ESBATech?

Alcide Barberis: It was. We actually had a discussion with another company on a licensing opportunity. But licensing would mean much less money, it would not be money for the shareholders, it would not be a return on investment. Because licensing would be a deal with the company and, of course, the shareholders could then decide to distribute dividends, but this is peanuts compared to the investment. In total, ESBATech raised more than 70 million Swiss Francs, so to make a return on investments on 70 million is not that simple with dividends. So, licensing was an option. But that would still entail additional investments, because it means that the company has to move forward, and it would be a revenue for the company, but not so much a return on investment for shareholders. And Alcon was not interested in licensing, they were

really interested in entering the biological domain in ophthalmology. So, that was what they did when they bought ESBATech. And that was the deal that shareholders agreed to.

Interviewer: So, it was also that kind of innovative technology and the people that Alcon was interested in and to really have them work for them?

Alcide Barberis: Exactly. Of course, it is not always like that in all the M&A cases. Alcon did not have any experience in biotechnology and not anything in antibodies or biologics and, therefore, it was a very wise decision to keep the company in place, at least with the researchers working on those projects. And then, of course, they brought in their expertise in clinical development, in marketing, and so on, and this was a very nice match I would say.

Interviewer: Alcon was then taken over by Novartis and the situation changed again, right?

Alcide Barberis: Yes, that changed, and unfortunately for the worse.

Interviewer: And Novartis already had a stake in Alcon at the time of the acquisition and Novartis Venture Fund also helped start the company in the beginning and continued to invest later on. Do you think this kind of connection was also fostering this deal in a way?

Alcide Barberis: No. I mean, of course, people knew each other, but it's not because we had an investment from Novartis that we went that way.

Interviewer: So, it was between ESBATech and Alcon, while Novartis at that point didn't play a role?

Alcide Barberis: Exactly.

Interviewer: In regards to the integration, I think you weren't with ESBATech anymore at that point of post-acquisition, is that correct?

Alcide Barberis: That's correct. I moved to Oncalis because it was a technology company and I was the R&D technology guy at that time. So, I moved to Oncalis. But unfortunately, Oncalis didn't work. But I was still door-to-door with ESBATech when ESBATech was acquired, but formally, I was no longer active in ESBATech. Of course, I was still a shareholder of ESBATech, but not in the management anymore.

Interviewer: Oncalis focused on small molecules, right? Does that mean pharmaceuticals and not biotechnology?

Alcide Barberis: That's right.

Interviewer: So, was that a strategic change for you?

Alcide Barberis: No. Of course, it requires chemistry for the molecules, but the specialty of Oncalis was not chemistry, the specialty was the yeast screening technology with two avenues, one for single-chain antibody fragments and the other for screening system of small molecules. It all came from the same original technology based on the yeast cells and my specialty was really yeast genetics and molecular biology. I started to develop parts of it on my academic level and it got further developed and optimised in ESBATech and in Oncalis. To set up the yeast cellular system to screen for activities on enzymes, on protein interactions, so targets that could have a potential therapeutic role, that's my specialty and that's why I moved to Oncalis.

Interviewer: With the integration, you mentioned in your article that Alcon did well to let ESBATech stay in Schlieren in the Bio-Technopark and to keep the employees as they were. Do you think there are other things that especially for start-up entrepreneurs in biotechnology need to be considered? So, what do you think are the challenges of being integrated and what are the aspirations that there could be when being integrated in such a big company?

Alcide Barberis: I don't think that there are many aspirations before. It really depends on how much flexibility and freedom to operate the acquirer allows, and that's what I mentioned before. The acquisition of Alcon by Novartis was not good news for the ESBATech people for the simple reason that Alcon contributed with their know-how in those areas where we didn't have any experience but let the company be, so the ESBATech people, the researchers, and the programs. Of course, there was a board of directors, people who controlled the budget and everything, but not on decisions on the level of micromanagement. When Novartis came in, it changed because Novartis wanted full control. You know, I wasn't there, it's not that I have first-hand experience but, of course, I talked to my former colleagues and I know that they were not happy. It was tolerated and still okay as long as Fishman was the head of R&D at Novartis. Then, it changed and there was a centralisation of the R&D units and that caused the closure, the shut-down of ESBATech.

Interviewer: Do you know whether the technology remained with Novartis?

Alcide Barberis: Yes, it did.

Interviewer: But they did not keep the R&D centre for future projects?

Alcide Barberis: Well, they said, "We're going to shut down the site in Schlieren." They did the same with a couple of other places around the world, and they said, "You can join the

research teams in Basel or in Boston." And some people went, while others didn't. But the specific know-how and the technology got lost or is at least not as active as it used to be.

Interviewer: That's truly a pity. I did some research in the field and I found out that most acquirers were successful if they – as Alcon did in the beginning – let the acquired company be independent and keep the innovation going.

Alcide Barberis: Absolutely. Another success story in Schlieren is GlycArt acquired by Roche. Now Roche is in Schlieren, but with the people of Glycart and the spirits of Glycart.

Interviewer: Yes, I am also having an interview with Pablo Umaña. I'm sure this is going to be really interesting.

Alcide Barberis: Definitely.

Interviewer: But it really is a pity about ESBATech. When I read your article, I felt very sorry to hear that such a successful company is no longer here.

Alcide Barberis: Yes, it just doesn't make sense.

Interviewer: And this also shows that there really is a difference in the strategic mindset between entrepreneurs in the biotech field and big pharma corporations, right?

Alcide Barberis: Yes. I don't know if you saw it but there was, about a year ago, a documentary by the Swiss German DRS, by Eco. They first presented Basel, you know, Roche and Novartis, and their research activity and what came out of the Basel research activities of these pharma giants. And it turned out, that the latest product that came out from research in Basel was Bepanthen. Everything else came out from research activities done somewhere else, in biotech companies or acquired by Novartis or by Roche. And then, they interviewed my partner at ESBATech, Dominik Escher, as well as other people from biotech companies, and they showed how many products actually came out from biotech companies, through acquisitions or licensing deals, and that was a quite interesting overview. It is essentially a business strategy of the pharma companies, it's much less expensive than setting up their own research centres, just looking for opportunities like ESBATech or GlycArt and then acquire them.

Interviewer: Yes, that's also what my desk research on that topic showed. It's impressive how much innovation and technology comes from biotech companies.

Alcide Barberis: Yes, but it is a lost race for the pharma companies, not because they don't have skills or money, but because the setup is different. In biotech companies, you have

enthusiasm, you have flexibility, you have people coming fresh out of the academic research. It's a totally different environment, much more creative, much more flexible and research-oriented. It's just different.

Interviewer: Yes, you can also see from the waves of acquisitions that occur that big pharma is now seeking to get access to this know-how and these skills, this innovative drive and entrepreneurialism. My thesis on this topic actually is that, as in the case of Glycart, if big pharma companies leave biotechs as independent as possible in their research, then they are more successful in keeping this biotech culture, which brings forward innovation.

Alcide Barberis: Exactly, this is why I think the dismantling of ESBATech didn't make sense, because I don't think that Novartis found ESBATech too costly to be maintained. It is more a personal decision, it's a typical big company attitude. The new guy comes in and has to do something different, he cannot just keep going because otherwise he would be a follower.

Interviewer: Yes, it is really a pity. If they, ESBATech and Novartis, collaborated and really prioritised what is important, things might have come differently.

Alcide Barberis: Yes.

Interviewer: Do you have any other points that are important with regard to integration? The human aspect, for example? Were there employees that left during the acquisition by Alcon or did employees from Alcon join ESBATech?

Alcide Barberis: No, apart from the board, nobody else joined ESBATech, I think. But people who left… Of course, people who had no role anymore during the acquisition, so the business development director, the CFO, all from those activities/departments that were taken over by Alcon. But the R&D people, they stayed. And the shareholders, as I wrote in my article, we were allowed to get a license on our technology that Alcon had acquired for non-ophthalmology applications and with that we founded Delenex. And I think a couple of people moved to Delenex, but these were technology specialists whose know-how would be more applicable in Delenex than in ESBATech.

Interviewer: Great, thank you for taking the time and providing me with these insights.

Alcide Barberis: Sure, have you been to the Bio-Technopark in Schlieren? I assume so, right?

Interviewer: No, I couldn't. Due to the current Covid-19 situation, it has not been possible.

Alcide Barberis: That's unfortunate. The interesting story about the Bio-Technopark in Schlieren is that it really came out from the necessity of lab space that biotech start-ups were looking for, and by chance, a company found a lab space there, because there was an ETH lab, and then ESBATech and two other companies moved to Schlieren in January 2002 as well. And the owner of this area, that used to be the Wagonfabrik Schlieren, he really saw the opportunity of getting the biotech business concentrated or clustered there and that's how the Bio-Technopark was started. Out of a spontaneous action.

Interviewer: That's a great story. And it has become a very important innovation cluster and brings many benefits for biotech companies. I mean, for innovation itself, collaboration and information exchange are so essential.

Alcide Barberis: Absolutely, yes. It's just great to be there. It's indeed important, in particular for investors as well as for pharma companies and potential partners. They see that you are situated in a high-quality place, surrounded by high-quality companies and that you are part of a respected family. That counts as well.

Interviewer: That is certainly so. The Bio-Technopark has brought out a lot of success stories. I really hope to visit it in the future.

10.5.4 Interview with Nicholas Franco, Representative of Actelion

WRITTEN INTERVIEW QUESTIONNAIRE

Interview with Nicholas Franco

- Executive Vice President and Chief Business Development Officer, Actelion Pharmaceuticals Ltd, subsidiary of Actelion Ltd. (until 2017)
- EVP & CBDO, Actelion Pharmaceuticals Ltd, a Janssen Pharmaceutical Company of Johnson and Johnson
- Allschwil Site Head, Actelion Pharmaceuticals Ltd, a Janssen Pharmaceutical Company of Johnson and Johnson

Interview Details:

Interviewer:	Francy Grubenmann, Student at ZHAW
Interview Partner:	Nicholas Franco
Date and Time of Interview:	Friday, 1st of May 2020, Email received at 11:28
Format, Place:	Written Questionnaire, Switzerland
Language:	English

Interviewer: What is your background and what was your role in the acquisition and integration of Actelion?

Nicholas Franco: As EVP & CBDO at the former Actelion, my role in the transaction was mainly during the due diligence and agreement phase as well as during the transition phase (i.e. pre-Closing of the transaction). Once the transaction closed (April 16, 2017), a global, cross-functional Integration Team was activated. It mainly included colleagues from J&J, who were assigned to the Integration Team for a certain period of time, and Deloitte manpower tasked to provide logistical support. My role during the integration phase was mainly supporting the Integration Team in providing them with information, either historical at Actelion or from the transaction and transition periods.

Interviewer: How was the integration management organised from both Actelion and J&J?

Sub-Questions:

- *Did the integration planning already happen at an early stage?*
- *Did the integration team consist of both Actelion and J&J managers?*
- *Were operational key employees involved/consulted for the integration management?*
- *Were there any noteworthy changes in strategy during the post-merger integration phase?*

Nicholas Franco: As mentioned above, a specific and dedicated Integration Team, of both J&J and Deloitte individuals, was established early on to lead and execute the integration plan. Some former Actelion colleagues were also involved in the integration, especially within the various functions and subfunctions. The Integration Team clearly identified and involved (former) Actelion colleagues who were responsible for key data or systems as these were critical in ensuring the transition to the J&J systems. The Actelion strategy of being the leader in cardiopulmonary diseases, mainly pulmonary hypertension, remains unchanged until today. The ways of operating and the organizational structure aligned itself to the J&J ways, but this was expected.

Interviewer: What kind of integration strategy was followed on an organisational level?

Sub-Questions:

- *Which parts of Actelion's value chain were taken over by J&J, and which were mostly left standalone (i.e. R&D [drug discovery/clinical testing] vs. non-R&D [marketing & sales])?*
- *Were any parts of J&J's value chain transferred to Actelion?*
- *Were the supporting functions (i.e. IT, HR, Finance) fully integrated?*
- *In what way did the core competencies of Actelion and J&J complement each other?*

Nicholas Franco: All parts of Actelion's value chain were taken over by J&J, except maybe the manufacturing of our products. Actelion had an established network of third-party suppliers (CMOs) manufacturing all of its products, with an internal organization managing this network. The network of CMOs has been maintained, while their management was integrated within the J&J Supply Chain organization, including the implementation of all its policies and processes. One of the main benefits related to the acquisition, i.e. expansion of the commercial availability of Actelion products via the Janssen global footprint, was initiated quickly after the closing. All supporting functions have been fully integrated within the global/regional/national J&J functions. An example of an enabler of any integration is how quickly the transactional systems/processes and indeed the legal entities can be merged. Keeping these elements separate can drive duplication of costs and ultimately slows the overall pace of integration. The Actelion integration actually managed to accomplish the merging of key systems and processes, while generating 'lessons learned' for future transactions.

Interviewer: What were the major challenges during the post-acquisition integration?

Sub-Questions:

- *Were there any challenges in the cultural, human, or organisational aspect of the integration?*
- *Did the integration change the corporate culture of Actelion?*
- *Were there any potential challenges in the integration management?*
- *How were these challenges addressed/overcome?*

Nicholas Franco: Both Actelion and J&J had/have a culture of innovation and putting the patient at the centre of its strategy. As such, there was not a major shift in the culture following the integration. Clearly the Actelion employees had to learn the new ways for doing things but extremely well-supported and staffed processes were put in place to ease the organization into the new processes/systems. An element of the success of the integration was the oversight at the highest levels of the J&J organization, providing quick decision-making, adaptation of the plans based on the actual situation and additional resources when necessary.

Interviewer: Which factors/aspects in the integration strategy did most contribute to the success of Actelion's integration?

Sub-Questions:

- *Which were the biggest sources of value creation?*
- *In what ways did the integration benefit Actelion and J&J?*
- *Did the acquisition/integration spur innovation?*
- *How was the unique corporate culture of Actelion preserved?*
- *How was employee retention and commitment ensured?*

Nicholas Franco: As announced at the time of the acquisition, the main value drivers were 1) the expansion of the availability of the Actelion products via the global Janssen footprint, 2) additional funding for the expanded development of the Actelion portfolio, and 3) the increased resources to increase the diagnosis and future treatment of patients with pulmonary hypertension. These continue to be the case today. Innovation has been at the core of both company strategies, pre- and post-acquisition. This remains today. The Actelion organization has implemented the many beneficial processes of J&J, while J&J has gained a deeper appreciation of the customer-intimacy model at Actelion, while implementing all the compliance programs in place.

Interviewer: Any additional comments on post-merger integration success?

Nicholas Franco: A well-designed plan, early involvement and dedicated resources are key to a successful integration.